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AIR FORCE

● *The Magazine of AMERICAN AIRPOWER* / *Published by the Air Force Association*

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New Deputy Secretary of Defense

GEN. NATHAN F. TWINING
Next Chairman of the Joint Chiefs of Staff

NEW TOP COMMAND IN THE PENTAGON

HON. JAMES H. DOUGLAS
New Secretary of the Air Force

GEN. THOMAS D. WHITE
Next Air Force Chief of Staff

ALSO IN THIS ISSUE:

Strategy and Organization for the Nuclear Age

How to Get More Engineering Mileage

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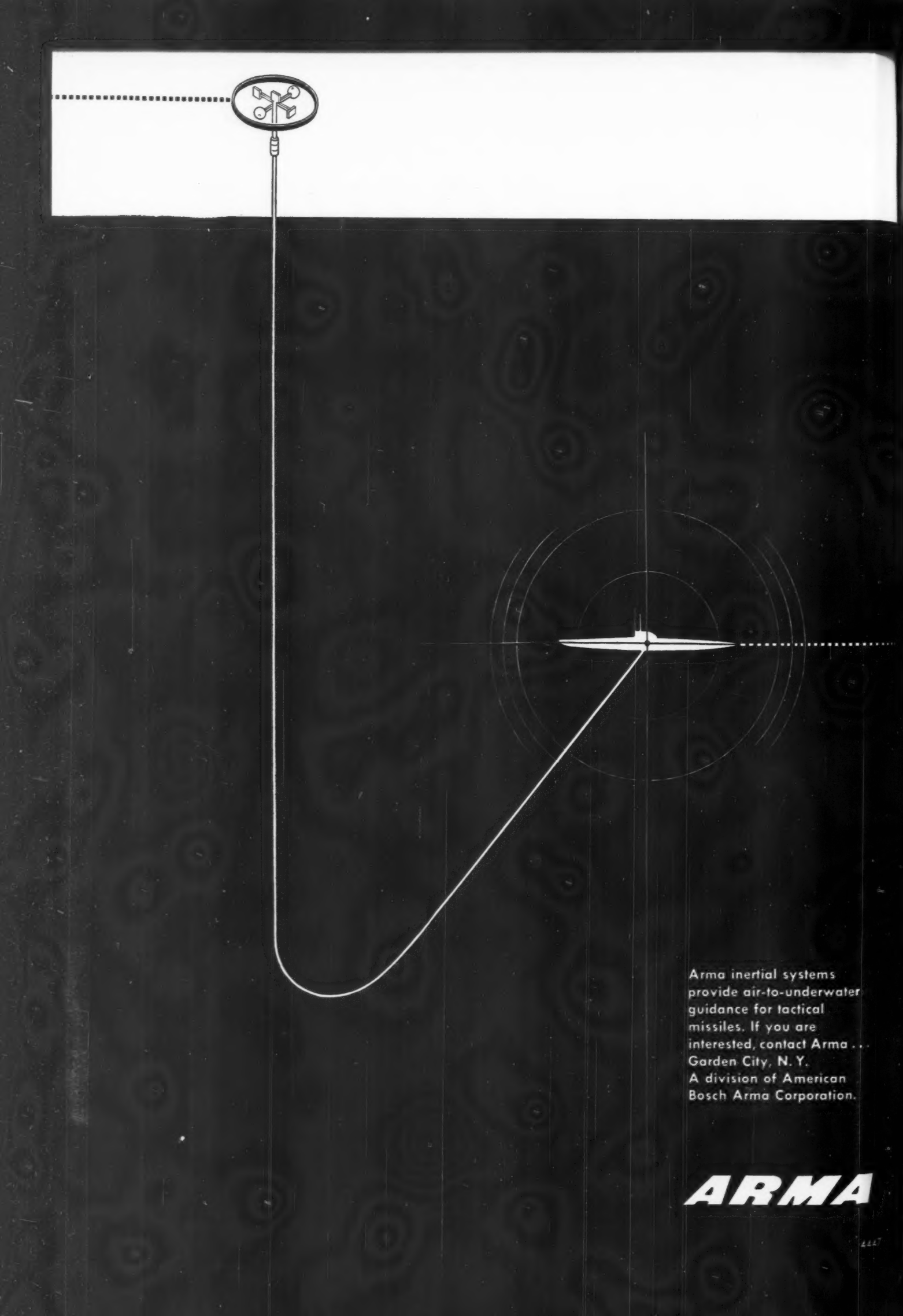
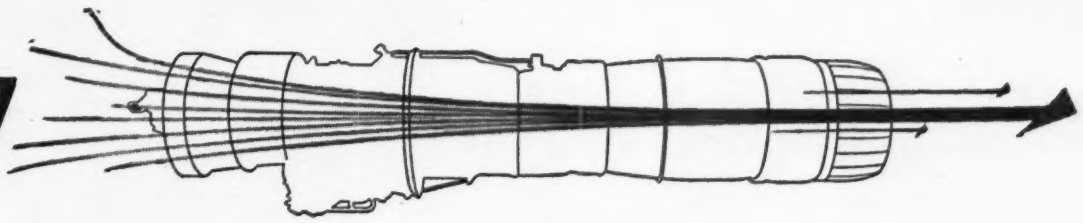


Arma inertial systems provide air-to-underwater guidance for tactical missiles. If you are interested, contact Arma . . . Garden City, N. Y. A division of American Bosch Arma Corporation.

ARMA

J57



The J57 is a big bruiser!

This turbojet engine weighs more than 5,000 pounds, develops more than 15,000 pounds of thrust, has thousands of parts—one of the smallest of which, a fuel nozzle seal, you see here.

But what do these figures really say about the J57 we build? Do they say it was designed by Pratt & Whitney, a division of United Aircraft Company?

. . . that it takes complete cooperation among the designer, Air Force, and manufacturer to make certain every engine meets rigid performance standards.

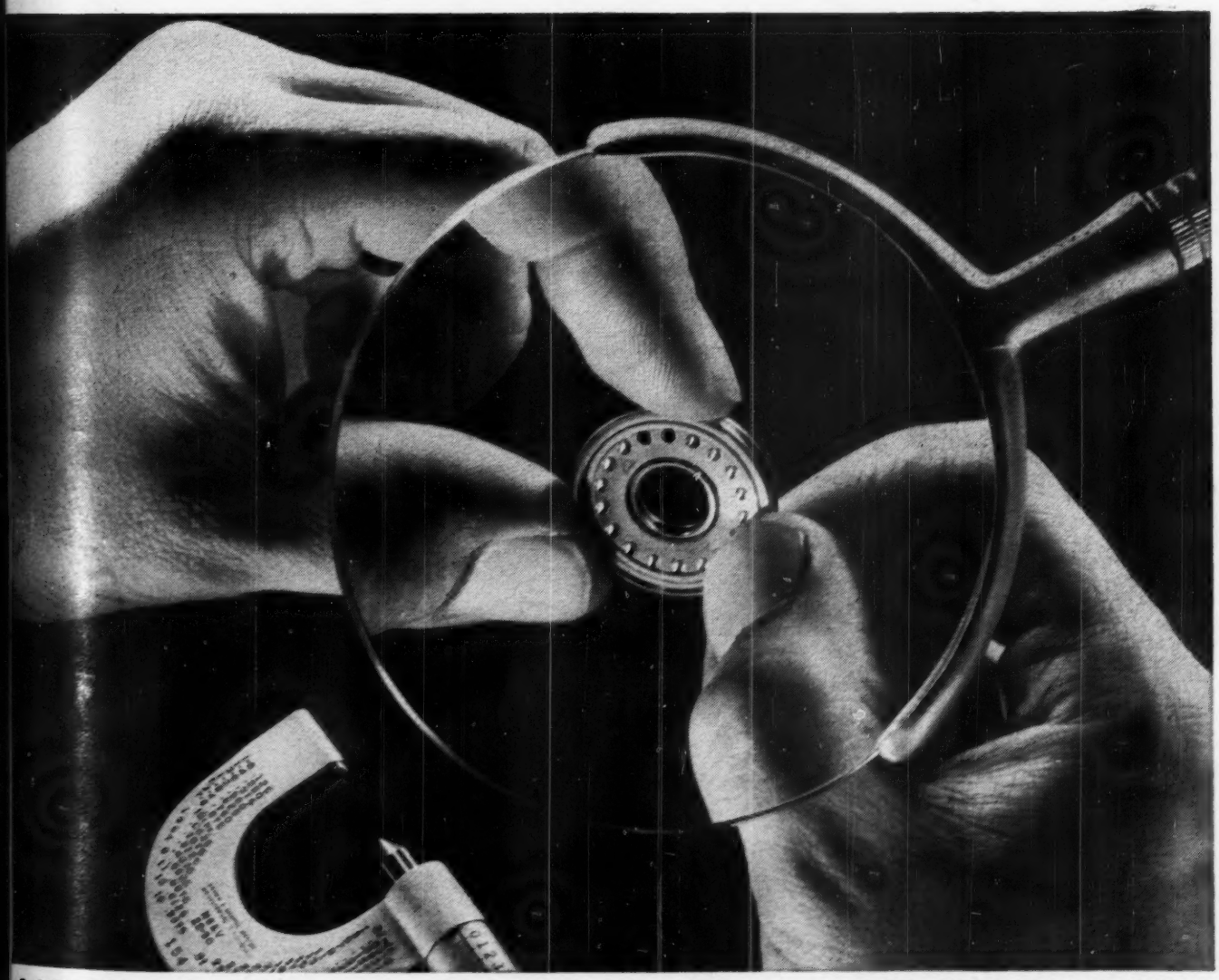
. . . that the J57 is used in some of the latest Air Force equipment: "century series" fighter models, B-52 intercontinental heavy bomber, and KC-135 tanker-transport.

. . . that it takes a vast network of parts suppliers reaching into 27 states to feed us the components we need to meet our schedules.

. . . that it takes teamwork *on every level* to establish and maintain quality volume production.

You can see cold statistics don't tell the full story. Unintentionally they miss this vital point: behind every completed engine lies a tremendous amount of cooperation and skill.

We believe the J57 jet engine is proof we've developed a high degree of both.



AIRCRAFT ENGINE DIVISION • FORD MOTOR COMPANY

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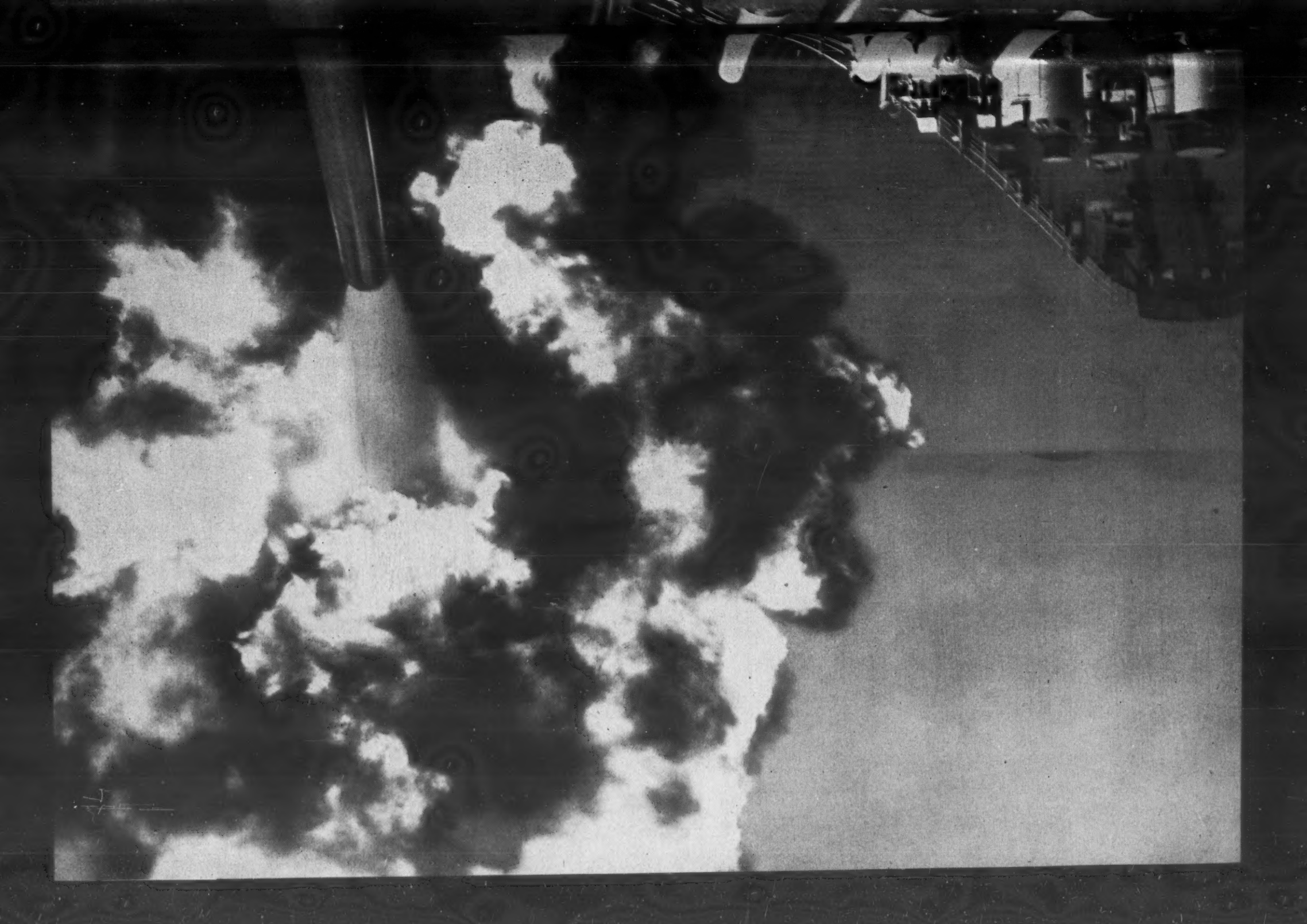


U.S.S. Missouri Firing 16-inch Guns, Official U.S. Navy Photo

THE U.S. AIR FORCE F-104 STARFIGHTER CAN OVERTAKE A 16-INCH SHELL IN MID FLIGHT. IT IS THE WORLD'S FASTEST JET. DESIGNED AND BUILT BY LOCKHEED.

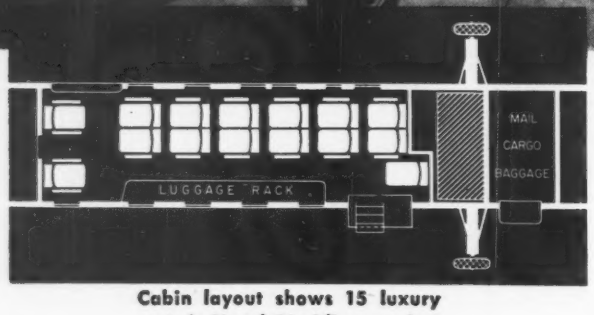
LOCKHEED *means leadership*

LOCKHEED AIRCRAFT CORPORATION: MISSILE RESEARCH & DEVELOPMENT • NUCLEAR-POWERED FLIGHT • ADVANCED ELECTRONICS • JET FIGHTERS • JET TRAINERS • PROPJET TRANSPORTS • LUXURY LINERS

New Vertol helicopter seats 19 passengers, doubles as freighter

For the first time, a large capacity helicopter, the Vertol 44, is available to commercial operators. And it comes with a selection of interiors suited for airline operation, executive transportation, or combination passenger-freight use.

Based on the design of the famous Vertol H-21, which has been flown more than 100,000 hours by the military services of the United States, Canada, France and West Germany, the Vertol 44 offers the versatility and cabin capacity long lacking in civilian helicopter operation.



Cabin layout shows 15 luxury seats in Vertol 44 airliner version.

Check these new Vertol 44 features:

- **Highest useful load, greatest seating capacity, lowest seat-mile cost in commercial helicopter field. Tandem rotor design allows passengers to sit any place in cabin and eliminates balance problem in placement of cargo.**
- **Internal capacity, approximately 600 cu. ft. of freight in cargo version. Can carry 2½ tons on external cargo sling.**
- **Capacity for 19 passengers, using high density seating arrangement. Luxury seats for 15 in airline version with large window next to every seat. Seats fold away for conversion in minutes to cargo configuration.**
- **Two large doors permit quick and easy loading and unloading; rear door folds down with integral stairway.**
- **Better high altitude performance with two-speed engine supercharger.**

Engineers, if you are not already working for the government or defense industry, investigate job opportunities with Vertol.

For detailed information on the Vertol 44 write to:

Customer Relations Manager

VERTOL Aircraft Corporation

MORTON, PENNSYLVANIA

AIR FORCE

THE MAGAZINE OF AMERICAN AIRPOWER

Volume 40, Number 5 • May 1957

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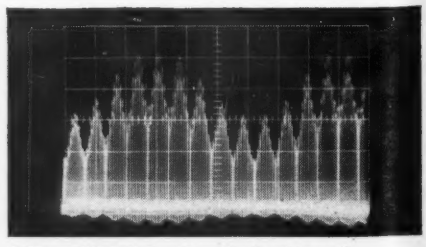
SAFE from the ground up

Hoffman Beacon Simulator bench tests TACAN-VORTAC for all-weather flying safety

The Hoffman-developed HLI-103 Beacon Simulator provides a sure, safe way to ground test airborne TACAN—and the TACAN portion of VORTAC. It duplicates the functions of a TACAN Land Beacon (AN/URN-3) and tests airborne units (AN/ARN-21) for azimuth from 0 to 360° with a ±0.2° accuracy or better, and range from 0 to 200 nautical miles with a ±0.1 mile accuracy or better. The Hoffman Beacon Simulator also tests the AN/ARN-21 at instrument airspeed from 0 to 1500 knots, land beacon identity tone and decoding functions—even simulates adverse weather conditions to assure complete operational reliability.

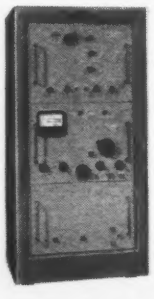
Hoffman TACAN-VORTAC test instruments, now used by the military services, are also available to aircraft manufacturers, commercial airlines and service operators to provide a vital, extra measure of flying safety for air navigation equipment *from the ground up.* Additional information will be promptly sent upon request.



Hoffman HLI-103 simulates the functions of TACAN Land Beacons. Photo shows 135 cps and 15 cps pulse burst detail. Phase relationships indicate surface beacon is due east of aircraft. Comparison of input settings with TACAN dial readings determines operational accuracy.

PHYSICISTS · ELECTRONICS AND ELECTRO-MECHANICAL ENGINEERS

Significant developments at Hoffman in the fields of TACAN, VORTAC, advanced navigation techniques, VLF, HF, VHF, UHF, forward scatter and tropospheric communications and advanced ECM have created important positions for physicists and engineers of high calibre. Please address inquiries to Vice-President of Engineering.



HOFFMAN HLI-103
BEACON SIMULATOR

Hoffman
LABORATORIES, INC.
A SUBSIDIARY OF HOFFMAN ELECTRONICS CORP.
3761 South Hill Street • Los Angeles 7, California

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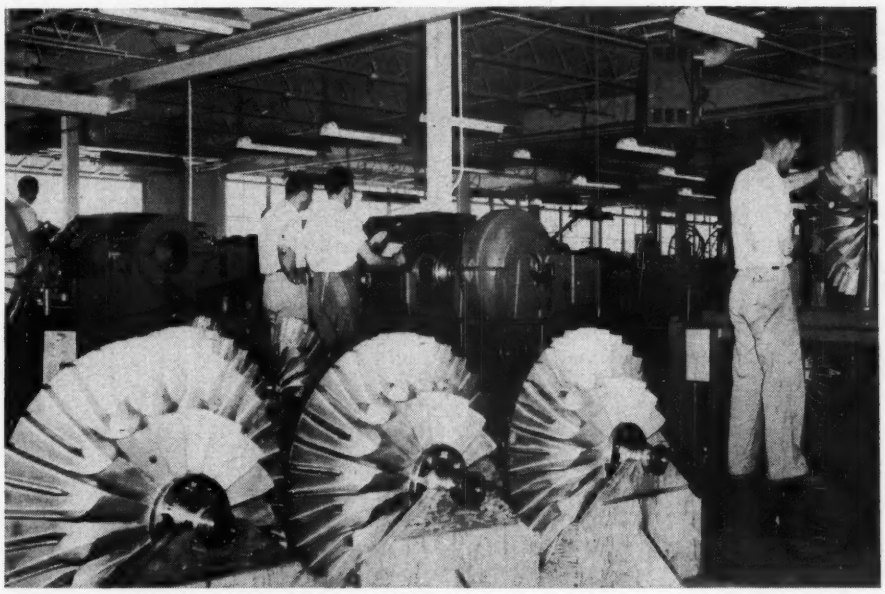
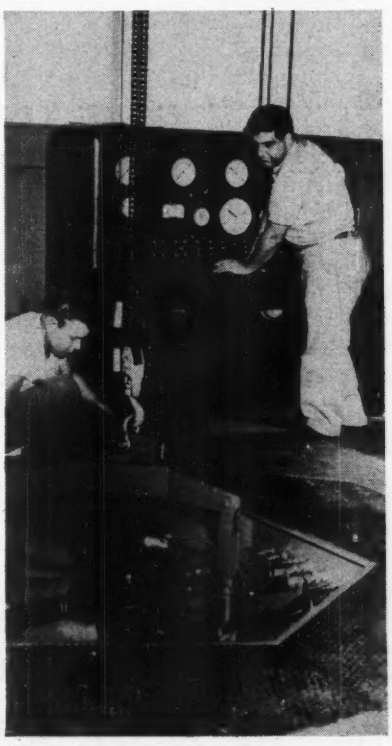


GET-UP-*and-go!*

The power output—the "Get-Up-And-Go"—of a jet engine is determined in large measure by the compressor rotor. In overhauling J-33 engines for the Air Force, Southwest Airmotive assures maximum compressor efficiency and reliability.



TOP PHOTO: *After careful rework, compressor rotors are balanced to a scientifically-fine degree on the Gisholt Dynetric Balancers at center and at left. Technician at right is inspecting a compressor's rotation in a true plane within specified limits.*

RIGHT: *After balancing, compressor rotors are turned by steam turbine, in an air-evacuated spin test pit, at an over-speed approximately 12% above normal operational speeds to determine their complete airworthiness. Their balance then is reverified.*

1932 A QUARTER CENTURY OF LEADERSHIP 1957 **Southwest Airmotive Co.**

LOVE FIELD DALLAS

air mail

Two for the Suggestion Box

Gentlemen: I wish to commend you on the content of your March '57 publication. Everything from your reports of legislative action to the monthly fiction feature is read with interest. More time is spent reading AIR FORCE Magazine in detail than is spent on any other individual periodical of the many I receive.

It is fully realized that it is difficult to satisfy all of the readers all of the time, and the following suggestions will not radically change the format. However, they are offered with the hope that their merits will be considered and possibly incorporated in some form or another if use can be found for them.

One thing which would be welcomed is more missile data, especially a comparison sheet of names and declassified specs. How about a complete V-2 story?

Another feature which would be of use would be an occasional "pin-up"—a full-color sheet of the latest planes and missiles. This could be used for framing and for instruction.

A last feature to be suggested is a monthly department devoted to CAP news of official nature. Yes, I know there is a publication devoted to this, but those of us who have much to read in a limited time would like to know of official releases and action without going through all of the social news along with it. You have many readers among the CAP groups and the above attitude has been expressed by others.

Lee Ruetz
Michigan City, Ind.

Gentlemen: I have only one criticism to make. AIR FORCE Magazine is good, but just why are about ninety-nine percent of the articles of the administrative type? For gosh sakes, why not have more true air-war stories? The *Royal Air Force Flying Review* is an extremely interesting magazine (British) and I'm quite positive that if you would publish more of the RAF magazine type of articles, along with the kind of articles you've published the last few years, you'd have the best air magazine in the world.

I must say in all truth, being a wartime crew chief with the 9th Air Force and a civilian private pilot, AIR FORCE articles for some time have become quite dry. *Most* of us *were not,* and *are not,* and will never be of the orderly room or headquarters-type personnel. So, let's get the magazine from behind the desk, out on the line, and into the air with some true Air Force articles on equipment and experiences, huh?

Lowell R. Wittibslager
Marion, Ohio

They'll Do it Every Time

Gentlemen: Got a chuckle out of your squib about "Miss Breezecake" [March '57 issue's "Shooting the Breeze"] whose charm and good looks are matched only by the beauty and luxury of the Piper Apache's interior.

Just to set your mind at ease, and

your readers' too, we've put Miss Breezecake at 6,000 feet (Apache's optimum cruise, 170 mph) where she can smoke to her heart's content. But isn't that just like a woman—she doused her cigarette!

William D. Strohmeier,
Vice President
Davis, Parsons & Strohmeier, Inc.
New York, N. Y.

Spiritual Value

Gentlemen: Three cheers for Chaplain Brown for his article entitled "Moral Force—Vital Element of Airpower?" which appeared in the February issue of AIR FORCE Magazine. A good article such as this each month will keep our perspective balanced between the materialistic and the spiritual.

For many years I have wondered why so much money is spent on clubs and recreation facilities while the religious facilities made available to the Chaplain are so meager. In the clubs, we have comfortable features too numerous to mention while in the chapels (usually small, plain structures, highly inadequate) we have the wooden benches with wooden kneelers.

In our haste for new and better weapons with which to protect ourselves, it often seems we are treating too lightly the only thing we possess that is worthy of protection. Our founding forefathers used the term "freedom of worship" not "freedom *from* worship." Without moral fiber, mechanical weapons will not do the trick; the will to fight has passed; the fight is over; slavery will be our deserved reward.

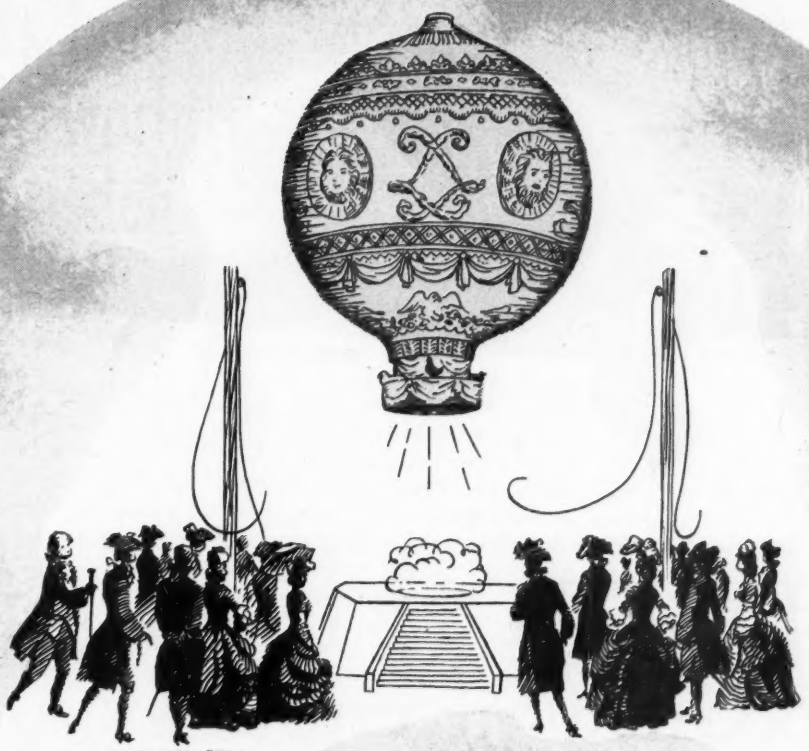
Maj. Glen R. Best
MAAG, Spain
APO, N. Y.

Memories

Gentlemen: An item in your February issue ["The Ready Room," p. 90] concerning the University of Alabama's beginning AF-ROTC flight instruction really brought back memories, some personal, some concerning AFA.

The personal ones surround Col. John P. Fraim, Jr., wartime CO of the 6th Ferrying Group, ATC, Long Beach, Calif. I was a student at Louisiana State University, Baton Rouge, La., during 1940-41, when Colonel Fraim, then a Reserve captain and former airline pilot, was a professor in Commercial Aviation at the School of Commerce. One of Captain Fraim's additional duties was the responsibility for the LSU Flight School, under the college-phase Civilian Pilot Training Program. Captain Fraim, for years, attempted to integrate the CPT program with the ROTC program but was rebuffed by Washington at every turn. We were allowed to wear "half wings" on our ROTC blouses before we soloed and "full wings" afterward, but that's about all. At that time, LSU

(Continued on page 11)



Globe Aerostatique . . . 1783

Montgolfier's vanguard project

A sheep, a duck, a rooster—the first payload carried aloft for atmospheric research. Louis XVI, his queen and his court, were astonished witnesses as Joseph Montgolfier's smoke-filled balloon rose in majesty 1500 feet over Versailles. The passengers? unharmed (except the rooster, kicked by the sheep).

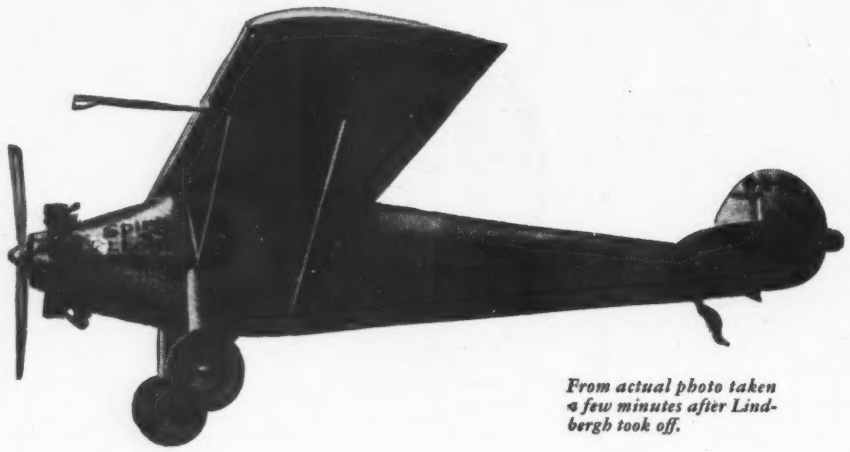
Project Vanguard, 1957, is an equally momentous "first"—an attempt to place a 21-pound satellite in an orbit 300 miles up. Aerojet-General, designer-builder of the famed Aerobee-Hi, will supply vital second-stage propulsion systems for Vanguard launchings during the International Geophysical Year.

Aerojet-General CORPORATION

A Subsidiary of The General Tire & Rubber Company

THE GENERAL TIRE

PLANTS AT AZUSA AND NEAR SACRAMENTO, CALIFORNIA



From actual photo taken a few minutes after Lindbergh took off.

LINDBERGH Lands in Paris on Goodrich Silvertowns

SILVERTOWNS across the sea! Landing on the dependable resilience of Silvertown Airplane Tires, Capt. Charles E. Lindbergh in his Ryan monoplane "Spirit of St. Louis" won his fight with death and distance. The stalwart cushioning of Silvertowns absorbed the landing shock of the first airship to fly from New York to Paris without a stop.

Silvertowns started Lindbergh safely on his way past the dangerous, critical seconds of the take-off at New York.

Silvertowns delivered him safe at Paris — safe from the fateful impact as his eagle plane swooped from the sky, and slammed its wheels down on Europe.

The first thirty seconds of the flight — the last thirty seconds of it!

The first 1,000 feet on the ground after Lindbergh cried "Okay" and they jerked the chuck blocks away from the Silvertown-shod wheels! The last 1,000 feet as the great monoplane hurtled across the Paris landing field.

These were seconds of held breath and tense nerves. Would the tires stand up as the 5,150 pounds of the loaded plane hammered and battered them along the runway? Would they hold the 46-foot wingspread of the eagle ship true to the course?

Would a tire fail in those seconds of grave stress? A blowout spelled the end of the magnificent venture, perhaps with a still greater adventure for the man in the cockpit.

Less than a minute of time, yet an eternity of suspense, the overseas plane thundered along the gauntlet of disaster.

Silvertowns held! Their sinewy strength, their sturdy cushioning stood the stress and strain that had doomed a thousand flights. Capt. Lindbergh soared away safe and landed safe.

Silvertowns met the test as they met it when this unheralded challenger, Capt. Lindbergh, started on his flight from San Diego to New York and made it in less than twenty-three hours.

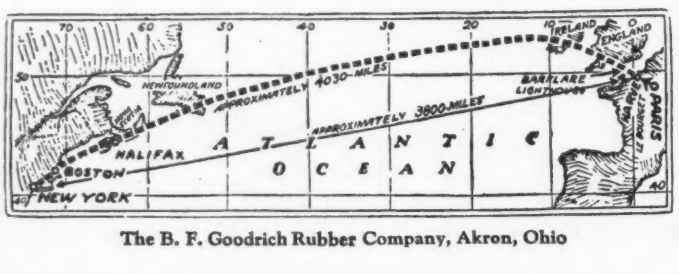
The dash through the clouds to Paris was a matter of gasoline, courage of the intrepid voyager of the skies — and Silvertown tires in the taking off over here and the landing over there.

The "Spirit of St. Louis" sped overseas a perfectly equipped airplane, instruments and parts the nearest to perfection ever assembled.

Captain Charles Lindbergh built it quietly at San Diego, counting on its mechanical perfection as well as his skill and courage to carry through to the goal.

And when it came to tires he fortified the security of his plane with Silvertowns. He underwrote the safety of his venture with the tires that have through years met the test of great moments of competition.

He called to his aid the same flexing strength, the same dependable endurance with which Goodrich Silvertowns have for years served the motor cars of the world.



The B. F. Goodrich Rubber Company, Akron, Ohio

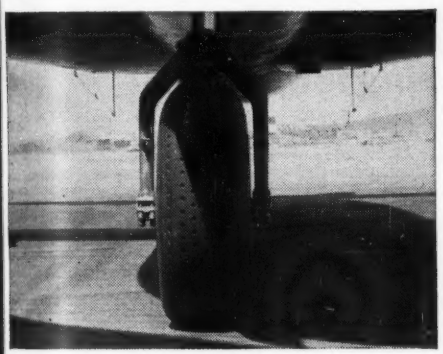
Goodrich Silvertowns

BEST IN THE LONG RUN

This ADVERTISEMENT appeared in June, 1927

Now pilots land all over the world on B. F. Goodrich Tubeless

THE MOST SIGNIFICANT development in tires since Lindbergh's flight is Tubeless, pioneered and patented by B. F. Goodrich. Now in service with overseas airlines and military planes, B. F. Goodrich Tubeless sets the pace because it saves weight, performs better.



B. F. Goodrich Tubeless Tires are making greater payloads possible by reducing weight as much as 120 pounds per plane. And while saving weight, BFG Tubeless Tires offer superior air retention, save time and money in warehousing and maintenance. That's why the trend is to B. F. Goodrich Tubeless.

B. F. Goodrich Tires "cross the Atlantic" again on a replica of the SPIRIT OF ST. LOUIS in the Leland Hayward—Billy Wilder motion picture production of Charles A. Lindbergh's Pulitzer Prize-winning story, "THE SPIRIT OF ST. LOUIS"... with JAMES STEWART as Charles A. Lindbergh, presented by WARNER BROS.

B.F.Goodrich

AVIATION PRODUCTS

A division of the B. F. Goodrich Co.

Akron, Ohio

had the second largest ROTC brigade in the country, with artillery, engineers, infantry, and signal corps regiments. But Air Force? Heaven forbid! It wasn't the school's fault; they could only go as far as Washington would let them. I wonder how Colonel Fraim feels now? I believe he's still in Southern California, in the automobile business.

The AFA memories concern Gill Robb Wilson's "Air World" column in the New York *Herald Tribune* of Wednesday, August 27, 1947. In this column he proposed the same integration, even before the idea of an Air Force Academy was broached. He reviewed the work that universities had done in the CPT program and even suggested that the Air University work a cooperative project with the University of Alabama!

All this goes to show that AFA was and is on the right track in sponsoring the program, but should pause, in honor, for a moment, of those pioneers who, like Gen. Billy Mitchell, were so far ahead of their time that they were castigated instead of commended—pioneers like Jack Fraim and Gill Robb Wilson.

Gerard E. Nistal
Flushing, L. I., N. Y.

High School Libraries

Gentlemen: I am a senior AF-ROTC student and member of the Arnold Air Society (Walter H. Beech Squadron) at the University of Wichita. The last time I went home for the weekend, my mother saw my copy of AIR FORCE Magazine. Mother is the librarian at Derby High School, and she asked me to send my copy of AIR FORCE to her library each month when I finish reading it. I was astonished when she told me that she was only allowed a subscription to one magazine which had anything to do with airpower. She said that in her library there was a great demand for this type of publication, but one magazine doesn't spread around too well.

In the high school which I attended, quite a few magazines of this type were available in the library, but they were in constant use, and they helped bring the message of airpower to my classmates. With all the recent clamor for educating the public to the significance of airpower, the best way to start would be for each high school library in the country to have a copy of AIR FORCE and as many magazines of this type as possible.

Perhaps you could make some kind of appeal to all of your readers to send their copy of AIR FORCE to their favorite high school library when they finish reading it. I'm sure the students would appreciate it. I'm sending mine to Derby (Kans.) High School.

Laurence N. Swink
Wichita, Kans.

We're Willing

Gentlemen: Would you please publish some Air Force adages or sayings such as "Look out for the Hun in the sun," etc., used by pilots and crew members during World War II?

Maj. Milton E. Castleman
Gulfport, Miss.

● *You readers send 'em and we'll print 'em.—The Editors.*

Soft Core

Gentlemen: I am a soft-core airman, T/Sgt., PAFSC 70270 and DAFSC 70250 (due to overages I have been performing duty at the fifty level for the past two years). My prospects of promotion are negligible.

Just as a matter of curiosity I made a check of the Unit Manning Documents of all units assigned this wing and found the following: there are seven *civilian* 70270 UMD authorizations in this wing. In addition to the administrative field there are another twenty-five seven-level civilian UMD authorizations (mostly in the supply and installations field) in other career fields that are surplus at the seven-level Air Force-wide. In other words, the Air Force has a large surplus of seven-level airmen in certain career fields and at the same time has seven-level civilian UMD authorizations in these same surplus career fields. If the situation in this wing is indicative of the Air Force-wide situation there are over 3,000 civilian seven-level UMD authorizations in career fields that have seven-level airmen overages Air Force-wide.

Considering the above described situation, I think I'd be forgiven for getting a big laugh out of the "Cut the Civilian Payroll Costs" drives that come down from higher headquarters from time to time.

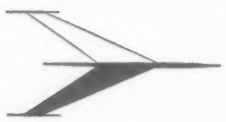
We "soft cores" are being encouraged to retrain into "hard core" career fields. Why not convert the above-mentioned civilian slots to military? Why should NCOs sacrifice their eight to fourteen years' experience in their career fields? Why continue to actually waste the taxpayers' money on this—both in civilian payroll costs as well as retraining costs? Maybe someone can explain this to me.

T/Sgt. John A. Webb
Selfridge AFB, Mich.

Register NOW for . . .

AIR FORCE ASSOCIATION'S 1957

National Convention Airpower Panorama



Celebrating the Golden Anniversary of the USAF

July 28 through August 4 ★ Washington, D. C.

IT'S A WEEK-LONG SHOW

The Air Force Association's 1957 National Convention and Airpower Panorama, climaxing the celebration of the Golden Anniversary of the United States Air Force, will cover a full week, starting Sunday, July 28, and ending Sunday, August 4. It will be divided into two sections—**Pre-Convention Events** and the **Convention Program.**

The Airpower Review on Sunday, July 28, will include static displays of old and new Air Force planes, aerial demonstrations by the Air Force's famous "Thunderbirds" aerobatic team, and fly-bys of modern jet planes. Highlight of the day will be the finish of the Air National Guard's all-jet Ricks Flight from Fresno, California, to Washington, D. C.

Reserve Forces Day will include presentations by officials from Air Force Headquarters, Continental Air Command, and the Air National Guard Bureau. A reception and banquet for Reservists and Guardsmen will climax the day.

Industry Day attendance is restricted to representatives of Industrial Associate Companies of AFA and military personnel. The program will include briefings by the Commanders of the Air Materiel Command and Air Research and Development Command and their staffs. A luncheon honoring AFA's Industrial Associate Companies will divide the two briefings.

The above events are not included in the $25 Convention registration fee. There will be no charge for attending the Airpower Review and the Reserve Forces Seminar. Tickets to the Reserve Forces Reception and Banquet will be $5 per person. Attendance at the Industry Day Briefings and Luncheon will be by Industrial Registration at $35 per person, which will include all of the events on the Convention Program.

USAF'S BIRTHDAY

August 1, mid-day of the Convention, is the fiftieth birthday of the US Air Force. The day will begin with a special Memorial Service in the Arlington National Cemetery. Later that morning, the Post Office Department will issue a new airmail postage stamp commemorating the Air Force's Golden Anniversary. Highlight of the day will be the Anniversary Banquet at noon. This program will sweep the fifty-year history of the Air Force, with many of the men who helped make its history on hand. The day will be climaxed by three Anniversary Balls in three hotels—the Sheraton-Park, Shoreham, and Statler. Each Ball will represent one of the wartime theaters of operation—**American, Asiatic-Pacific,** and **European-African-Middle Eastern**—with special decorations and entertainment symbolizing the countries represented, and name bands providing the music.

REGISTER NOW

More than 1,600 persons have reserved hotel rooms for the Convention. Both the Sheraton-Park and Shoreham Hotels, Convention Headquarters, are out of rooms. Only 2,000 persons can be seated in the Convention banquet hall. It is evident that this year's Convention will be another "sell-out." To the right is a form for use in registering in advance for the Convention Program. Right now is the time to fill out this form and mail it to AFA Headquarters in Washington, along with a check or money order for the registration fee. The form is designed for registering husband and wife simply by checking "LADIES" if the wife will attend. There are three important reasons for registering in advance: One, it will eliminate waiting in line at the registration desk; two, only advance registrants can be assured a seat in the banquet hall; and three, only those who register in advance may select the Anniversary Ball they desire to attend. Make sure that you are covered by mailing your registration form and check today.

See Page 15 for Hotel Reservation Form.

PRE-CONVENTION EVENTS

AIRPOWER REVIEW

Andrews Air Force Base

SUNDAY—JULY 28

2:00 PM: Aerial & Ground Demonstrations
USAF Thunderbirds Performance
Finish of Ricks Jet Flight

RESERVE FORCES DAY

TUESDAY—JULY 30

1:00 PM: Reserve Forces Seminar
5:00 PM: Reserve Forces Reception
6:30 PM: Reserve Awards Banquet

INDUSTRY DAY

WEDNESDAY—JULY 31

9:00 AM: Air Material Briefing
12:15 PM: USAF-Industry Luncheon
2:30 PM: Research & Development Briefing

Convention Program Registration Fee $25

Only those persons who register in ADVANCE for the *Convention Program* may select the Anniversary Ball they wish to attend. Late registrants will be assigned to Ball having available space.

CONVENTION PROGRAM

WEDNESDAY—JULY 31:

9:30 AM: *AFA Leaders Meeting*
2:30 PM: *First AFA Bus. Session*
7:00 PM: *Panorama Preview Reception*

THURSDAY—AUGUST 1: *Anniversary Day*

9:00 AM: *Air Force Memorial Service*
10:00 AM: *Airpower Panorama*
USAF Stamp Ceremony
12:30 PM: *USAF Anniversary Banquet*
9:00 PM: *Anniversary Balls*

FRIDAY—AUGUST 2:

9:00 AM: *Second AFA Bus. Session*
10:00 AM: *Airpower Panorama*
12:30 PM: *Airpower Luncheon*
Fashion Luncheon
3:00 PM: *Airpower Symposium*
7:00 PM: *Reunion Cocktail-Buffet*

SATURDAY—AUGUST 3:

9:00 AM: *Third AFA Bus. Session*
10:00 AM: *Airpower Panorama*
2:00 PM: *Final AFA Bus. Session*
7:00 PM: *Awards Banquet*

SUNDAY—AUGUST 4:

9:30 AM: *Airpower Brunch*

Complete, Clip, and Mail to AFA, 324 Mills Building, Washington 6, D. C.

ADVANCE REGISTRATION FORM FOR 1957 AFA CONVENTION

NAME..... RANK.....

TITLE.....

AFFILIATION.....

ADDRESS.....

CITY..... STATE.....

Please check ONE of the following categories with which you wish to be identified in the attendance record:

( ) GOVERNMENT ( ) ACTIVE MILITARY ( ) AFA
( ) INDUSTRY ( ) RESERVE GUARD ( ) .....

* *INDUSTRIAL REGISTRATION ($35) restricted to personnel of AFA Industrial Associate Companies ONLY, and includes INDUSTRY DAY plus the CONVENTION PROGRAM.*

I ( ) AM ( ) AM NOT AN AFA MEMBER

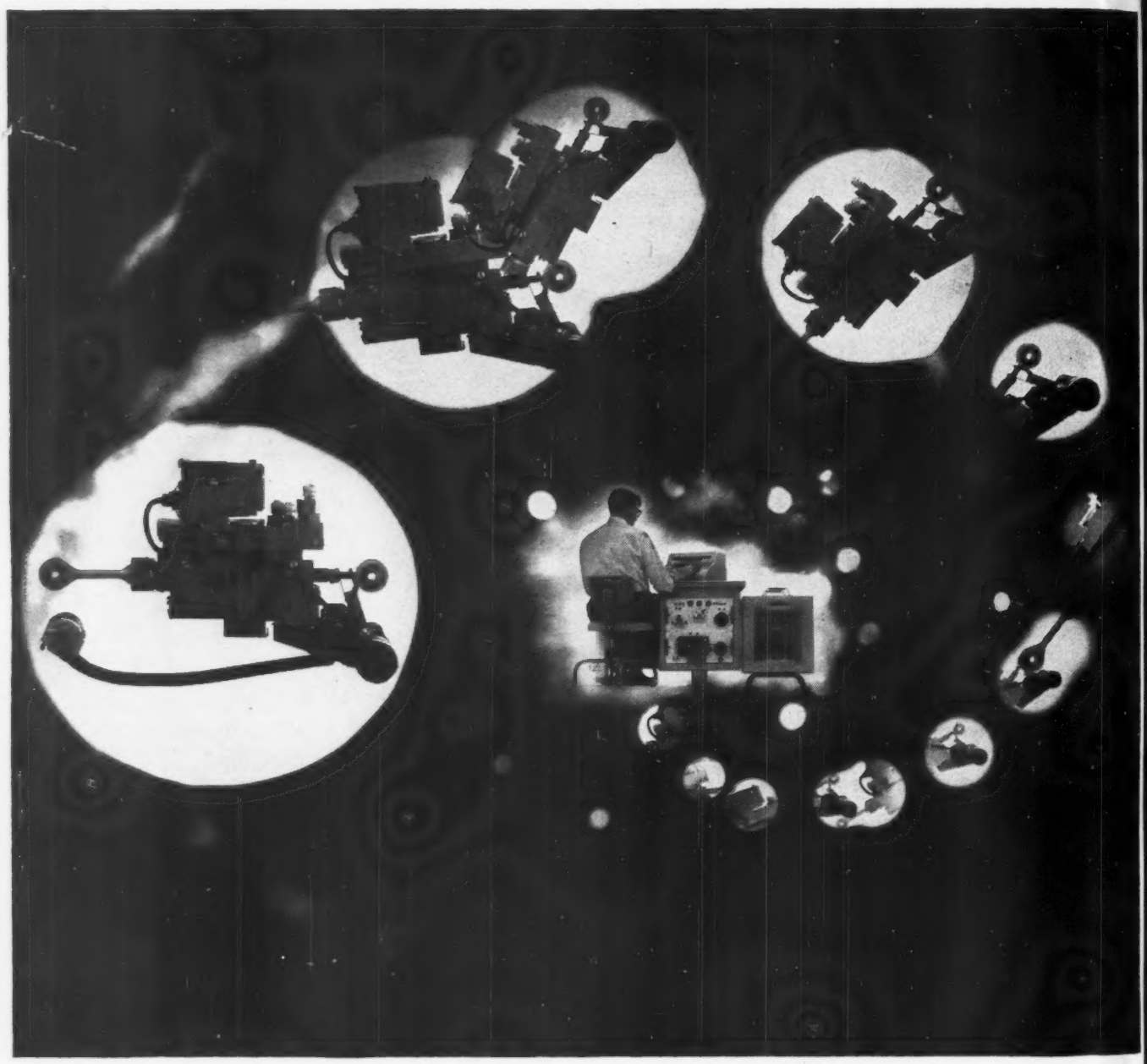
Check the type(s) of registration desired and attach full payment:

( ) MEMBER $25
( ) LADIES $25
( ) INDUSTRIAL* $35

TOTAL: $

Please check the ANNIVERSARY BALL you wish to attend August 1:

( ) AMERICAN THEATER
( ) ASIATIC-PACIFIC THEATER
( ) EUROPEAN-AFRICAN-MIDDLE EASTERN THEATER



Man's electro-mechanical partners are bringing his ideas to life faster...better...at less cost

Today one of industry's most formidable tasks is to streamline and shorten the time-consuming process that transforms ideas into exciting new products.

Never in man's history has this embryonic period needed to be shortened more than now—when technological superiority could very well be the world's best hope for peace.

And nowhere is this challenge being met more energetically than in the development and production of automatic control systems at AUTONETICS. For instance, *Numill*—a new automatic machine-tool system invented by AUTONETICS—often turns the engineer's rough sketch and mathematical notations into prototype parts more rapidly than he could reach the blueprint stage with previous methods.

Standardized "postage-stamp" circuits allow engineers to mockup even highly advanced designs almost as simply as they would plug in an electric shaver. And AUTONETICS' data processing equipment can simulate a wide range of operational missions, as well as solve the most involved mathematical problems in minutes instead of days.

AUTONETICS' ability to save time and money between concept and product delivery is reflected in every area of its electro-mechanical technology: flight controls, inertial navigation, armament controls, computers, and other complete systems for the military and industry.

For detailed information, write AUTONETICS, Dept. F-73, 9150 E. Imperial Highway, Downey, California.

Autonetics

A DIVISION OF NORTH AMERICAN AVIATION, INC.

AUTOMATIC CONTROLS MAN HAS NEVER BUILT BEFORE

By Wilfred Owen

Ten years ago it cost $1,000 to fly across the Atlantic and back. Today the same round trip can be made for about $400.

• • •

Eight cities in the US enplaned more than a million passengers last year. They were New York, Chicago, Los Angeles, Washington, San Francisco, Miami, Detroit, and Atlanta.

• • •

The installation of a turboprop engine on a transport that formerly used conventional piston engines boosted its power sixty-three percent and decreased its weight 5,000 pounds.

• • •

The CAA high-altitude air traffic control system to be inaugurated this year will eventually control all aircraft flying above 15,000 feet anywhere in the US. Control is presently limited to the ten-mile-wide federal airways that connect major cities.

• • •

Airport planning for the Jet Age is reflected in this year's CAA aid to state and local governments, twenty-two percent of which is going for land acquisition, mostly for clear zones at the end of runways.

• • •

The world's scheduled airlines use fifty different types of aircraft.

• • •

The British claim to have the world's most advanced helicopter close to completion. The Fairey Rotodyne, powered by two turboprop engines and auxiliary jets in the rotor blade tips, will carry forty passengers at a speed of at least 150 miles per hour.

• • •

A total of 9,350,000 passengers traveled on international air flights last year. They accounted for eighteen percent of the world's airline passengers and twenty-nine percent of total airline passenger-miles.

• • •

There were no passenger fatalities on US international air carriers during 1956.

• • •

The International Air Transport Association has issued a 250-page booklet telling how to cut red tape on the world's airlines. Subjects include clearance of aircraft and passengers through trans-border formalities, procedures for customs and immigration, medical requirements, monetary exchange facilities, and the design of airports to keep passengers and freight moving.

• • •

The Brooklyn Dodgers have an $800,000 Convair to provide them with transportation during the 1957 baseball season. The plane will also carry the Dodgers' farm clubs, including St. Paul, Montreal, and Fort Worth.

• • •

Emigrants from Europe to the United States and Canada may now fly the transatlantic route at a special reduced rate equal to sixty percent of the one-way tourist fare.

MAIL YOUR RESERVATION REQUEST NOW!

AFA National Convention & Airpower Panorama

WASHINGTON, D. C. ★ JULY 30-AUGUST 4, 1957

Since more than 3,000 delegates and guests will attend the Convention, everyone cannot be accommodated at the Sheraton-Park and Shoreham, headquarters hotels. Therefore, rooms and suites at the Sheraton-Park are restricted to AFA delegates and Industrial Associate companies. The number of suites at the Shoreham is limited, but is not restricted. The hotels below are listed in the order of their distance from the Sheraton-Park, with the Shoreham nearest, etc. The Continental is suggested for Panorama exhibit personnel.

AFA Hotels and Room Rates

HOTEL	SINGLE	DOUBLE	TWIN
Sheraton-Park	Sold Out	Sold Out	Sold Out
Shoreham	$9.00	$14.00	$14.00
Windsor-Park*	9.00	12.00	12.00
Dupont Plaza*	9.50	12.50	12.50
Woodner*	None	13.50	13.50
Mayflower*	9.00	14.50	16.50
Statler*	11.50	15.00	16.50
Lee House	8.50	12.00	12.00
Burlington	7.50	10.00	10.00
Ambassador	7.50	11.00	12.00
Hamilton	7.00	10.50	10.50
Continental	7.00	9.00	10.00

* *Suites available—one bedroom, $25; two bedroom, $40. Above rates are averages—lower and higher rates are available.*

Mail to:

AFA HOUSING OFFICE
Convention & Visitors Bureau
1616 K Street, N.W., Washington 6, D. C.

DATE_____

NAME_____

ADDRESS_____

CITY & STATE_____

HOTEL_____ (FIRST CHOICE) _____ (SECOND CHOICE) _____ (THIRD CHOICE)

_____ (TYPE ROOM) ( ) Low ( ) Average ( ) High (DESIRED RATE)

ARRIVAL DATE & HOUR_____

DEPARTURE DATE_____

OTHERS IN ROOM_____

AIRPOWER IN THE NEWS

■ The **British White Paper** on that nation's **defense policy for the next five years** promises the **most revolutionary changes ever made in any nation's military structure in "normal times."** With one broad stroke of the pen, Britain moved last month to **scrap her traditional defense system**—with its overseas garrisons, battleship squadrons, and complex base structure—and eventually to put out to pasture **her long-range bombers and jet fighters.**

And by 1960, the British plan to **abolish their draft** and **cut their combat-ready armed forces** from the present total of 690,000 men to **375,000 regulars.** Even more significant is the decision to put an **immediate stop** to all work on design and construction of **late-model, supersonic bombers and fighters.**

These decisions mean an **immediate saving** of some **$785 million** in Britain's current defense budget, which will now be just **under $4 billion** for the period 1957-58.

In place of her "conventional" armed forces, Britain proposes to rely in the future upon **atomic and nuclear weapons, guided missiles, and rockets.** Toward this end, she is continuing to give top priority to **her own production** of these weapons and is **relying heavily on the United States,** both for **close cooperation** in military research and development and for **many of the tools** for the sort of war the British envision.

■ At presstime a **long-range blueprint** for improving the **safety and efficiency of the nation's airways** was on its way from the White House to Capitol Hill. The plan was the result of more than a year's work by the **President's Aviation Facilities Planning Group,** headed by **Edward P. (Ted) Curtis,** AFA Director and wartime AF major general. In general, the blueprint was said to call for:

- Creating an **independent airways modernization board,** charged with coordinating research in the field of flying safety.
- A drastic **overhaul of air traffic control regulations** to reduce the ever-growing collision menace.
- A sort of **"super-highway" system of the sky,** with certain routes and altitudes reserved for planes of like speeds.

The proposed modernization board would be composed of an **Assistant Secretary of Defense,** an **Assistant Secretary of Commerce,** and **Mr. Curtis** himself. It would coordinate a research effort now scattered over dozens of agencies.

The revised air traffic regulations would divide the air space into **two "modes."** The **"all-weather mode"** would apply above specified altitudes and in dense terminal areas, and the aircraft would be under instrument flight rules at all times. The **"dual-weather mode"** would have traffic regulations similar to those now in effect, but with certain speed limits and minimum visibility standards.

The **"super-highway"** system would be similar to an auto highway, with lanes for trucks and passenger cars.

■ **AIRCRAFT.** . . . USAF's first supersonic recon aircraft —the **McDonnell RF-101 Voodoo**—was assigned last month to a **Tactical Air Command** wing at Shaw AFB, S. C. . . . Meantime, the AF has **successfully flight-tested** another version of the Voodoo—**the F-101B**—one of three USAF interceptors able to carry **"Ding Dong"** (MB-1), the air defense rocket which has a **nuclear warhead** and is designed to be fired into **formations of attacking enemy aircraft.** The other two interceptors that will carry Ding Dong are the **Northrop F-89J,** now in service in limited numbers, and the **Convair F-106,** advance version of the delta-wing F-102. . . . In ten years we "should be knocking on the door" of speeds of **Mach ten** (7,600 mph), **Lt. Gen. C. S. Irvine,** the AF's DCS/Materiel, told the **Society of Automotive Engineers** last month. "The only performance limits in speed and range are priority in the **use of engineers** and the impelling necessity to **keep costs within the framework of our national well-being,"** General Irvine said. Meanwhile, he pointed out, we must speed the development of materials able to withstand **hypersonic speeds** (3,000 to 3,500 mph). . . . At the same meeting, **AF Brig. Gen. Joseph D. Caldara,** Director of Flight Safety Research, took the opposite tack and criticized aircraft designers for attaching **too little importance** to the **physical limitations of man.** The **speeds** of modern military planes, General Caldara said, now **exceed the ability of pilots** to manage them.

■ **AIRPOWER NOTES.** . . . The Atomic Energy Commission's **1957 test series of atomic weapons,** scheduled to begin the middle of this month, is expected to be confined largely to tests of **nuclear-armed guided missiles,** both of the surface-to-air and air-to-air variety. . . . **Army Ordnance** is relying on a new missile, **the Hawk,** to plug one of the gaps in the Nike air-defense system. The Hawk is designed for **defense against low-level attacks** and will be armed with an **atomic warhead.** . . . The **Navy** has a new high-velocity aircraft rocket, **Zuni,** a five-incher with folding fins and powered by solid propellants. **An air-to-air** weapon, it has been approved for **operational use** with the fleet. . . . The **National Advisory Committee for Aeronautics** has presented its highest award, the **Distinguished Service Medal,** to former NACA Chairman, **Dr. Jerome C. Hunsaker.** . . . **AMC's Gen. Edwin W. Rawlings** last month received the **Gen. William Mitchell** award of the Aviators' Post of the **American Legion** in New York City. . . . USAF has announced that the **Air Research and Development Command** has won the **Daedalian Trophy for 1956.** The trophy is presented annually to the major command having the most effective aircraft accident-prevention program. . . . A **posthumous award** of the **Distinguished Flying Cross** has gone to **Capt. Milburn G. Apt,** who died testing the X-2 rocket research plane (see AIR FORCE, March '57).

■ **STAFF CHANGES.** . . . Biggest news of the month, with regard to staff changes, resulted from **President Eisenhower's** nominations of **AF Secretary Donald A. Quarles** to be Deputy Secretary of Defense; **James H. Douglas** to be Secretary of the AF; **Gen. Nathan F. Twining** to be next Chairman of the Joint Chiefs of Staff; and **Gen. Thomas D. White** to become new AF Chief of Staff, with **SAC Gen. Curtis E. LeMay** as his new Vice Commander. For more on these personnel shifts, see page 59.

In other changes, **Brig. Gen. Wilford F. Hall,** Chief Medical Officer, SHAPE, has replaced **Maj. Gen. Olin F. McIlnay** as Director of Plans and Hospitals, Hq., USAF. General McIlnay moved up to Deputy Surgeon General, Hq., USAF, replacing **Maj. Gen. William H. Powell,** who went to SHAPE as Chief Medical Officer in this three-way move. . . . **Brig. Gen. Leslie G. Mulzer** retired from his assignment as Commander, Dayton AF Depot, AMC. **Brig. Gen. Charles A. Heim** will assume command of the Depot in May.

Maj. Gen. Robert W. Douglass, Jr., has retired. His

(Continued on page 21)

FRENCH CHESSMEN FROM THE HERMAN STEINER COLLECTION. (12TH CENTURY)

STRATEGIC WEAPON—Closely shrouded in secrecy during years of development and testing, the Snark SM-62, like the powerful queen in chess, is an important strategic weapon. The Snark, America's first intercontinental guided missile, is now scheduled for delivery to the Strategic Air Command of the U.S. Air Force. Designed to deliver a nuclear warhead to a target 5,000 miles from its mobile launching platform, the Snark is a strong deterrent to any aggressor. Like the new Northrop T-38 supersonic jet trainer, the Snark was developed with Northrop's realistic understanding of national defense budget limitations. These, and other weapon systems designed and produced by Northrop, are examples of the continued corporate effort to aid the defense department in maintaining "security with solvency" by using the best resources of science and technology to develop low-cost solutions to defense problems.

NORTHROP

NORTHROP AIRCRAFT, INC. · HAWTHORNE, CALIFORNIA

Builders of the First Intercontinental Guided Missile

Convair B-58

HUSTLER!

Powered by General Electric jets, B-58 is world's fastest bomber, will pay off in better U. S. defense

Today, your "defense dollars" are buying a new aircraft designed to fly much faster than a .45 caliber pistol bullet—the Air Force's Convair B-58 Hustler, powered by General Electric J79 jet engines.

Spectacular in appearance, the B-58 is the nation's *first* supersonic bomber. Its mighty General Electric J79's—most advanced jets ever produced in this country—develop more power per pound than any other U. S. jet engines of comparable size in production.

But what does the B-58 mean to you? Because the new plane can deliver an extremely potent weapon to fulfill America's fast-changing airpower needs, the Hustler is a major deterrent to aggressors. Thus it means *better defense.*

Providing our Armed Forces with the complex equipment needed to keep peace is a continuing goal at General Electric. For as we see it, progress in defense is vital to the future of America. *General Electric Company, Cincinnati 15, Ohio.* 235-20

SMALL, LIGHT, AND POWERFUL, the new General Electric J79 also powers the U.S. Air Force's Lockheed F-104A, world's fastest production fighter. Above, G-E men who sparked J79 development: Neil Burgess (left) and Gerhard Neumann.

Progress Is Our Most Important Product

GENERAL ELECTRIC

AVRO CF-100 NIGHTFIGHTERS AT WORK

SERVICED AND ARMED

POISED

TAKE-OFF

ALOFT

ON DUSK TO DAWN PATROLS

The Royal Canadian Air Force nightfighter crews who fly these powerful CF-100's know that they guide one of freedom's most efficient weapons in the defence of North America and Western Europe.

•

Four RCAF squadrons of CF-100's have been assigned to NATO to meet its specific nightfighter requirements.

AVRO AIRCRAFT LIMITED

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MEMBER: A. V. ROE CANADA LIMITED & THE HAWKER SIDDELEY GROUP

duties as AF Member and Chairman, US Section of the Joint Mexican-US Defense Commission, AF Delegate, Joint Brazil-US Defense Commission, and Senior AF Delegate, Inter-American Defense Board, were assigned to **Maj. Gen. Richard C. Lindsay** in addition to his primary assignment as Assistant DCS/Operations, Hq., USAF. . . . **Lt. Gen. Glenn O. Barcus** moved from his position as Commander, Northeast Air Command, to Chief of Staff, US European Command. . . . **Brig. Gen. William M. Gross,** Deputy Commander, Twelfth AF, TAC, will replace **Brig. Gen. Ernest K. Warburton** as Chief of Staff, Hq., TAC, June 15. General Warburton will replace **Brig. Gen. John A. Hilger** as Commander of the AF Operational Test Center. General Hilger will become Chief of the USAF Group, Joint Military Mission for Aid to Turkey.

Brig. Gen. Fred M. Dean, Deputy Commander, Flying Training AF, ATC, became Commander of Air Task Force 13 in March, replacing **Brig. Gen. Benjamin O. Davis, Jr.,** who is assigned to Hq., USAF, June 15, with no specific assignment announced. . . . **Brig. Gen. Hewitt T. Wheless,** Commander, 801st Air Div., SAC, has been reassigned to Hq., USAF, as Chief, War Plans Div., DCS/Operations. . . . **Brig. Gen. Waymond A. Davis,** Director, Procurement and Production, DCS/Materiel, Hq., USAF, becomes Assistant for Production Planning, replacing **Maj. Gen. Thomas P. Gerrity.** General Gerrity will replace **Maj. Gen. William O. Senter** as Commander of the Oklahoma City AMA, AMC, August 14. General Senter will be assigned to Hq., AMC, as Director, Procurement and Production, replacing **Maj. Gen. David H. Baker,** who will replace **Maj. Gen. Daniel F. Callahan** as Assistant for Programming at Hq., USAF, August 15. General Callahan will become Commander of AMC's Mobile Air Materiel Area.

Brig. Gen. Lester W. Light, Assistant Chief of Staff, Materiel, USAFE, will replace **Brig. Gen. Don O. Darrow** as DCS/Materiel, MATS, August 1. General Darrow will move to Deputy Commander, Pacific Div., MATS, replacing **Brig. Gen. George S. Cassady,** who will become Deputy Commander, Atlantic Div., MATS. . . . **Maj. Gen. Emery S. Wetzel,** current MATS Atlantic Div. Commander, will be replaced by **Maj. Gen. William S. Stone,** July 15. General Wetzel will become Deputy Chief of Staff for Plans and Operations, Hq., FEAF (Rear). **Maj. Gen. Raymond J. Reeves** will replace General Stone as Assistant DCS/Personnel, Hq., USAF. **Brig. Gen. John S. Hardy** will move up to Director of Military Personnel, the spot vacated by General Reeves, June 15. . . . **Brig. Gen. Charles H. Pottenger,** Deputy for Personnel and Administration, Hq., FEAF, will replace **Maj. Gen. Russell L. Waldron** as Commander, 315th Air Div., FEAF, July 1. General Waldron will become Commander, Continental Div., MATS.

Brig. Gen. Donald L. Hardy, Chief, AF Section, Military Assistance Advisory Group, Japan, will replace **Brig. Gen. Laurence B. Kelley** as Deputy Commander, Mobile AMA, AMC, July 15. General Kelley will become Director of Logistic Plans, DCS/Materiel, Hq., USAF, replacing **Brig. Gen. James P. Newberry,** who will move to Hq., USAFE, as DCS/Materiel, July 9.

Brig. Gen. Daniel W. Jenkins, Commandant, USAF Ground Operations School, TAC, will become Deputy Commander, Eighteenth AF, TAC, in September. . . . **Brig. Gen. Cecil H. Childre,** Commander, 463d Troop Carrier Wing (Med), will replace **Brig. Gen. Avelin P. Tacon, Jr.,** as Director of Operations and Training, Hq., TAC. General Tacon will be assigned as Commander, 450th Fighter Day Wing. . . . **Maj. Gen. Lee B. Washbourne,** Assistant Chief of Staff, Installations, Hq., USAF, will be replaced by **Brig. Gen. Augustus M. Minton,** June 15. General Washbourne will be reassigned to Assistant Chief of Staff, Installations, Hq., USAFE. . . . **Brig. Gen. Christian F. Dreyer,** Director of Installations Engineering, SAC, will go to Hq., USAF, for duty with the office of Assistant CofS, Installations, June 15.

Brig. Gen. Kenneth H. Gibson, Commander, 8th Air Div., ADC, will replace **Brig. Gen. T. Alan Bennett** as Commander, 11th Air Div., AAC, July 3. General Bennett will become Deputy for Materiel, Hq., ADC. . . . **Maj. Gen. Frederic E. Glantzberg** will replace **Maj. Gen. Ernest Moore** as Vice Commander, MATS, June 1. General Moore will go to USAFE as Commander, Third AF. . . . **Brig. Gen. Keith K. Compton,** Commander, 823d Air Div., will become Commander, 5th Air Div., SAC, July 1, replacing **Maj. Gen. Joseph J. Nazzaro.** General Nazzaro will replace **Brig. Gen. Elvin S. Ligon, Jr.,** as Director of Personnel Planning, DCS/Personnel, Hq., USAF. General Ligon will become Commander of the 3500th Recruiting Wing, July 1, replacing **Brig. Gen. Arno H. Luehman.** General Luehman will replace **Brig. Gen. Andrew J. Kinney,** Director, Office of Information Services, Hq., USAF, on June 15. General Kinney will become Commander, 3345th Technical Training Wing, ATC.

Maj. Gen. Matthew K. Deichelmann, Senior Member, UN Military Armistice Commission, has moved to Special Assistant to the Commander, Hq., FEAF (Advance). . . . **Brig. Gen. Haskell E. Neal,** DCS/Communication and Electronics, CADC, will replace **Brig. Gen. Daniel C. Doubleday** as Commander, 1807th AACS Wing, MATS, July 1. General Doubleday will move up as Deputy Commander of AACS. . . . **Brig. Gen. Ezekiel W. Napier,** Deputy Commander, CAirC, will be assigned to Hq., USAF, Office of the Secretary of the AF, as a member of the Personnel Council, July 15. . . . **Maj. Gen. Henry K. Mooney,** Commander, Fifteenth AF, will become Commander, Middletown Air Materiel Area, AMC, May 15. His Deputy Commander will be **Brig. Gen. Charles B. Root.** . . . **Maj. Gen. Walter I. Miller,** Director of Accounting and Finance, Hq., USAF, goes to Hq., USAFE, as DCS/Comptroller, June 24. . . . **Brig. Gen. Richard L. Scott,** Deputy Director of Accounting and Finance, Hq., USAF, became Comptroller, Hq., ARDC.

Brig. Gen. Kurt M. Landon, Deputy Commander for Resources, Hq., ARDC, will be reassigned as Assistant CofS, Materiel, FEAF (Rear), June 19. . . . **Maj. Gen. Robert M. Lee,** Commander, 4th Allied Tactical AF, SHAPE, and **Maj. Gen. Edward J. Timberlake** exchange commands. General Timberlake, Commander of the Ninth AF, TAC, will assume command of the 4th on June 22. . . . **Brig. Gen. Beverly H. Warren,** Deputy for Materiel, Hq., FEAF, will be assigned to Hq., AMC, August 15; no specific assignment was announced. . . . **Brig. Gen. Marcus F. Cooper,** previously scheduled for assignment at Hq., USAF, will be assigned to Edwards AFB as Commander of the AF Flight Test Center, ARDC, July 2, replacing **Brig. Gen. J. Stanley Holtoner,** who will become Deputy Commander, Third AF, USAFE, May 31. . . . **Brig. Gen. Donald P. Graul,** Commander, 1818th AACS Wing, MATS, will become Commander of the Rome Air Development Center, ARDC, July 31. . . . **Maj. Gen. Brooke Allen** will succeed **Maj. Gen. A. Grussendorf** as Commander, 6th Allied Tactical AF, SHAPE, in June. Headquarters are at Izmir, Turkey.

The following generals retired, effective February 28: **Maj. Gen. Burton M. Hovey, Jr., Maj. Gen. Robert W. Douglass, Jr.,** and **Lt. Gen. Richard E. Nugent.**—END

What's New With ★ RED AIRPOWER

Here's a summary of the latest available information on Soviet air intelligence. Because of the nature of this material, we are not able to disclose our sources, nor to document the information beyond the fact that the sources are trustworthy.

This column reported in the January issue that the Soviet Union was going to come forth with a four-engine turboprop transport airplane before long, and that the airplane in question was more or less an outgrowth of the twin-engine turboprop assault transport Russia displayed on Soviet Aviation Day last June.

Pravda, the Communist Party newspaper in the USSR, published a picture of the airplane in March. Called the *Ukrainia* (*see* "Airpower in the News," April '57), it is a high-wing transport with four turboprop engines (each about 4,000-5,000 eshp), and a narrow main gear that retracts into the fuselage. The Russians claim it cruises at 360 mph at 24,000 to 30,000 feet, and can carry eighty-four passengers as well as three and a half tons of cargo. There is a large ramp-type door in the rear of the fuselage. *Pravda* said nothing about the aircraft's range, but other reports indicate it is meant to be a long-range aircraft that could be used to cross such spans as the South Atlantic, between Africa and South America.

° ° °

There is reason to believe that one of the Soviet Union's principal atomic installations is near Alma Ata, in south-central Siberia. Both hydrogen and conventional atomic weapons are thought to be in production there at a plant located in the foothills of the Tien Shan Mountains.

° ° °

Latest European estimates are that eighty-five percent of the Soviet Union's long-range bombers are based above the Arctic Circle (north of Russia's principal airline routes). The bases have been set up in the pattern that would be best suited for transpolar air strikes against the continental United States and to hit Alaska from Siberia.

° ° °

Back in 1925 the Soviet government organized the first airplane flight from Moscow to Peiping, China. It was made in an R-2 aircraft, powered by a single 240-hp. engine, and took five weeks to complete.

Now the Russians say they are making the flight from Moscow to Peiping in their turbojet-powered TU-104s in a matter of hours. At Peiping a huge new airport is being constructed to handle more and larger jet airplanes.

The Russians are saying publicly that they soon will step up service at Prague, Czechoslovakia, and predict that city will become one of the air-transport hubs of Europe and the major jumping-off place for air traffic to the Orient via Moscow, Omsk, Irkutsk, and Peiping. A strong hint is made that the Soviet Union would like to extend jet transport service from China to Tokyo.

° ° °

The Russians also can be expected to seek landing rights in the United States before long. They soon will have jet aircraft able to fly the Atlantic non-stop, as well as the northern Pacific route from Tokyo or eastern Siberia via Alaska to the US proper.

Tupolev, the top Russian aircraft designer, is said to have two new turbojet transports somewhere between the prototype and production stages. One is a ninety-five- to 100-passenger type; the other is said to have room for 180 passengers. Sergei Ilyushin, the cautious designer of many Russian transports, also has readied a jet-powered airplane for public display.

It may be that 1957 will be a big year in Russian air transport development.

° ° °

There have been some unconfirmed reports that Pavel Zhigarev, Air Chief Marshal of the USSR, has been tossed out of office. While this has not been confirmed, two of his predecessors, whom Stalin once put out of office, have been very much in evidence in the past year. One is K. A. Vershinin, who directed the Soviet air forces during the battle of Stalingrad and later was head of all Soviet air forces within the Ministry of Defense. The other is Marshal Alexander Novikov, who headed Russia's tactical air force until 1946, when Stalin sent him to Siberia. He was brought back from a prison camp in 1953 and is thought to be a sick man.

There is good reason to wonder why Zhigarev remains in office. His speeches indicate him to be only the tub-thumping type, with none of the grasp or penetration of a man like Marshal Zhukov, for example. Furthermore, he is a Stalin appointee carried over by an administration that avowedly has no love for the old corpse in the mausoleum outside the Kremlin walls.

° ° °

The Soviets report officially that their North Pole Number Six station on the polar ice cap has drifted 1,250 miles in nine months. The station includes several buildings as well as meteorological and other equipment. It was established and now is supplied entirely by air. IL-12s carried in men and equipment, using a runway first formed by spraying water on the ice. A group of men set down by helicopter performed this chore. One or more helicopters are assigned to each polar station.

The fact that the Russians now refer to their latest station as Number Six, does not mean that they have five other stations on the ice cap. Several of the early stations —such as Numbers One and Two—have been abandoned.

° ° °

The USSR has charted much of the bottom of the Arctic Ocean and certainly knows more about that area than any other nation. Most of the data is kept in the Arctic Institute's library and files at Leningrad.

The Soviets have gathered weather information that aids them in operating aircraft and ships in the polar regions. The information also is useful in predicting weather for the USSR. Arctic experience has pointed the way toward Soviet development of new navigation equipment, since conventional radio and electronic navigation aids often blank out when exposed to such phenomena as the aurora borealis (northern lights) found in the region.

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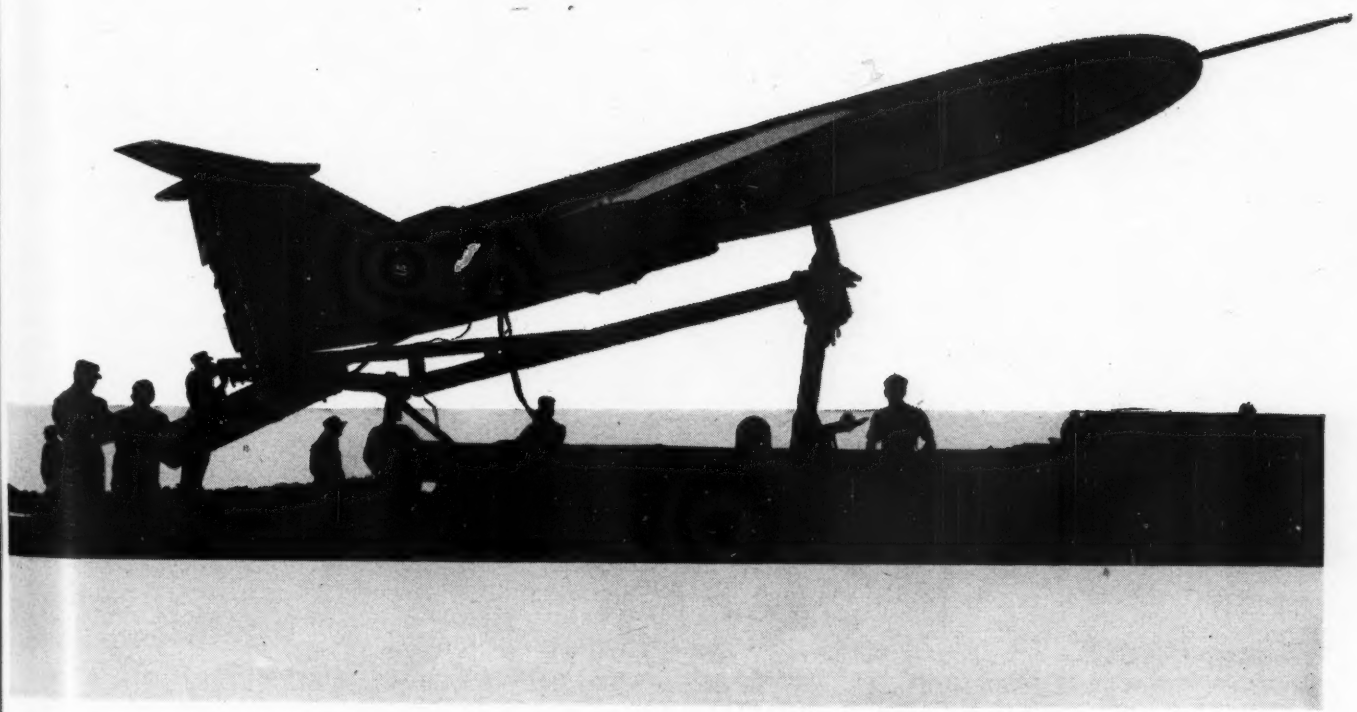
As a result of the recent outbreak in the Middle East, the British found the Egyptians had received an excellent anti-tank rocket and gun from the USSR. The Russian rocket gun fires an eighty-five-mm. weapon that is spin-stabilized upon launching.—END



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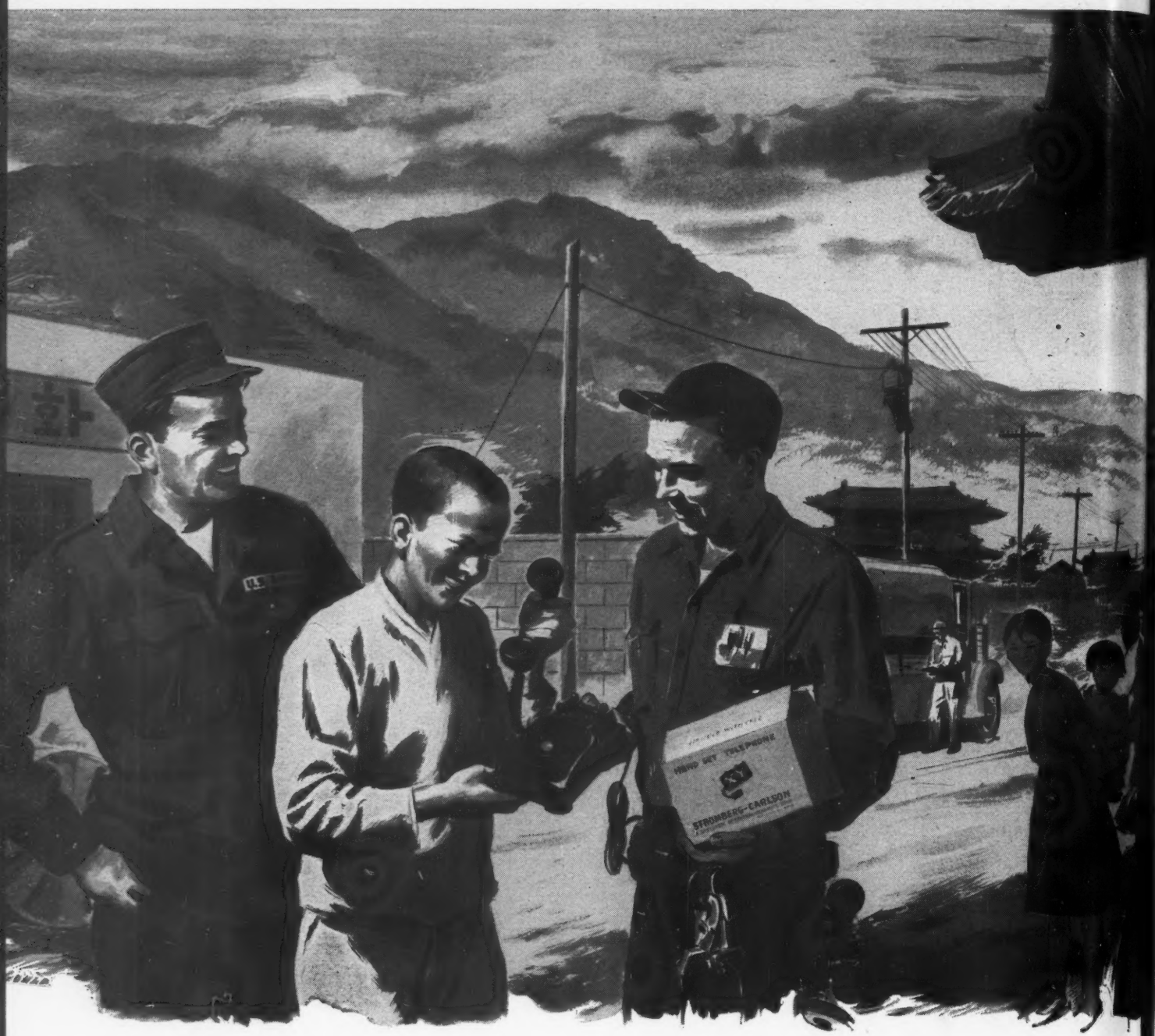

Systems engineering—38th parallel style

Here's the challenge we received from the Korean Civil Assistance Command and the U. S. Army Signal Corps:

Build a telephone communications system to their specifications that will function over mountainous terrain. Cost to be within reasonable limits . . . upkeep minimum . . . equipments compatible with the experience and background of the population.

The answer is the system now being installed in South Korea.

Manually operated telephones, central offices and PBX switchboards, suited to a civilian population unfamiliar with dial methods.

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"A Fine Deal," says Captain Weisberg

Capt. Arthur R. Weisberg, of SAC's 24th Bomb Wing, first grounded flyer to receive payment under Flight Pay Protection, shows check to Mrs. Weisberg, their two children, and family pet, "Whiskey." "A fine deal," says Captain Weisberg. "It's tough to lose $200 a month suddenly. This way you have up to two years to adjust your standard of living."

Brig. Gen. Edward J. Tracy, Command Surgeon, Air Materiel Command, writes: "AFA Flight Pay Protection has my most hearty approval and support. . . . The loss of flying pay is quite a severe shock to the family budget and your plan provides an adequate period of financial readjustment . . . A boon to our flying safety program.

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You sign up and pay a premium of only one percent of your ANNUAL Flight Pay. Then, if you're grounded due to accidental bodily injury or disease, our AFA Plan pays you monthly indemnity for loss of flight pay for up to twenty-four months, after a waiting period of 180 days for military aviation accidents, and ninety days for other accidents or disease. Then insurance payments pick up retroactively where the government left off.

All members of the US Air Force, Air National Guard, Air Reserve, and the other military services, who are on flight status and who belong to the Air Force Association, are eligible.

NOTE: Of course, this protection does not apply in case of war, declared or undeclared, or hostile action, civil war, invasion, or the resulting civil commotions or riots. There are also other exclusions which may never apply to you, but you are entitled to know them. They are as follows:

Plan does not cover losses due to a criminal act of the AFA member; or from bodily injury occurring while in a state of insanity (temporary or otherwise); or from officially certified "fear of flying"; or caused by intentional self-injury, attempted suicide, criminal assault committed by the Member, or fighting, except in self-defense; or from failure to meet flying proficiency standards unless caused by or aggravated by or attributed to disease or accident; or accidents caused while riding or driving in any kind of race; or by alcohol, drugs, venereal disease, arrest or confinement; or willful violation of flying regulations resulting in suspension from flying as a punitive measure; or sentence to dismissal from the service by a general court-martial, submitted resignation for the good of the service, or suspension from flying for administrative reasons not due to accident or disease or voluntary suspension. Loss of life shall not be deemed as a loss for purposes of this plan.

In the event you receive the total limit of twenty-four (24) months' indemnity, your coverage is automatically terminated. You may thereafter reapply for insurance coverage in the same manner as a new Member. Coverage also ends with termination of membership in AFA, or with resignation, retirement, or pensioning from the service, or at age sixty.

This insurance is renewable at the option of the Company.

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I certify I am currently on flying status and entitled to receive incentive pay, and that to the best of my knowledge I am in good health, and that no action is pending to remove me from flying status for failure to meet physical standards.

SIGNATURE OF APPLICANT _____ DATE _____

Application must be accompanied by check or money order for annual premium.

The annual premium charge is one percent of ANNUAL flight pay.

Send remittance to Air Force Association, Mills Building, Washington 6, D. C.

airman's bookshelf

During the Korean war, the *Air University Quarterly Review* sent its Associate Editor, Capt. Jim Sunderman, on an annual trip to the Far East to "cover" the air war. This coverage resulted in a wealth of primary combat air documents, some researched and written on the spot by the AU reporter, others prepared and by-lined by the men fighting the war, from Sabrejet pilots to the FEAF commander. From 1951 to 1954 this material appeared in a continuing series in the *Quarterly Review*. Today the best of this series has been collected in the first commercially published Air Force book on the Korean war.

Airpower: The Decisive Force in Korea, edited by Col. James T. Stewart, USAF (D. Van Nostrand, $6.75), has four main categories: the fight for control of the air (air-to-air and air-to-ground action); applied airpower (fighter-bomber and light- and medium-bomber action); supporting combat air elements (strategic photo reconnaissance, airfield construction, maintenance, air rescue, and troop carrier); and "A Look Back . . . and Ahead" (lessons learned and applied for the future). Each category is prefaced by brief editor's remarks that form an over-all framework for proper understanding and interpretation.

The book leads off with a classic air document, "The Air Campaign in Korea," by Gen. O. P. Weyland, FEAF's wartime commander. General Weyland's keen analysis of air strategy and how tactical operations fit into this strategy introduces many thought-provoking ideas on the role and use of air forces in limited war. Using General Weyland's broad presentation as a base, Colonel Stewart builds his book "stone upon stone." Subsequent sections and chapters deal with operational strike studies and tactical phase analyses. For example, the aerial destruction of the vast North Korean hydroelectric power system, the air envelopment of the vital bridge complex at Sinanju-Yongmidong, and the bombing of the Communist irrigation dam network emerge as elements of military air pressure applied to accomplish specific theater politico-military objectives.

The last section is the editor's main contribution. Here, Colonel Stewart—former Assistant Deputy for Operations, FEAF, and now Deputy Assistant for Development Programming, DCS/Dev., Hq., USAF—is well qualified to re-examine the objectives and limitations in Korea; the use, effects, and cost of airpower in Korea; and the atomic-air application of tactical air forces in possible future limited conflicts. And where Korea leaves unanswered the larger prospects of future unlimited war, the editor draws on AF Col. Ray Sleeper's *Airpower, the Cold War and Peace,* as a helpful guide. Colonel Sleeper outlines the means for using airpower as a foundation for persuasion to encourage international good behavior. Using past examples, including Korea, Colonel Sleeper presents a strong case for continued peace through strong airpower in the years ahead.

The volume has several obvious flaws: in glossing over the evolution and role of combat air logistical support in modern war; in omitting the role of the medium night intruders (B-26s) in Korea; and in not examining the contributions of *tactical* air photo reconnaissance. Though Colonel Stewart overlooked one fine *Quarterly Review* air logistics article in compiling his work, responsibility for the other deficiencies is not his. Like all FEAF subordinate echelons, combat cargo, night intruder, and the recon units were urged to contribute to this documentary of Korean air operations. Their hesitation to do so now leaves a critical vacuum.

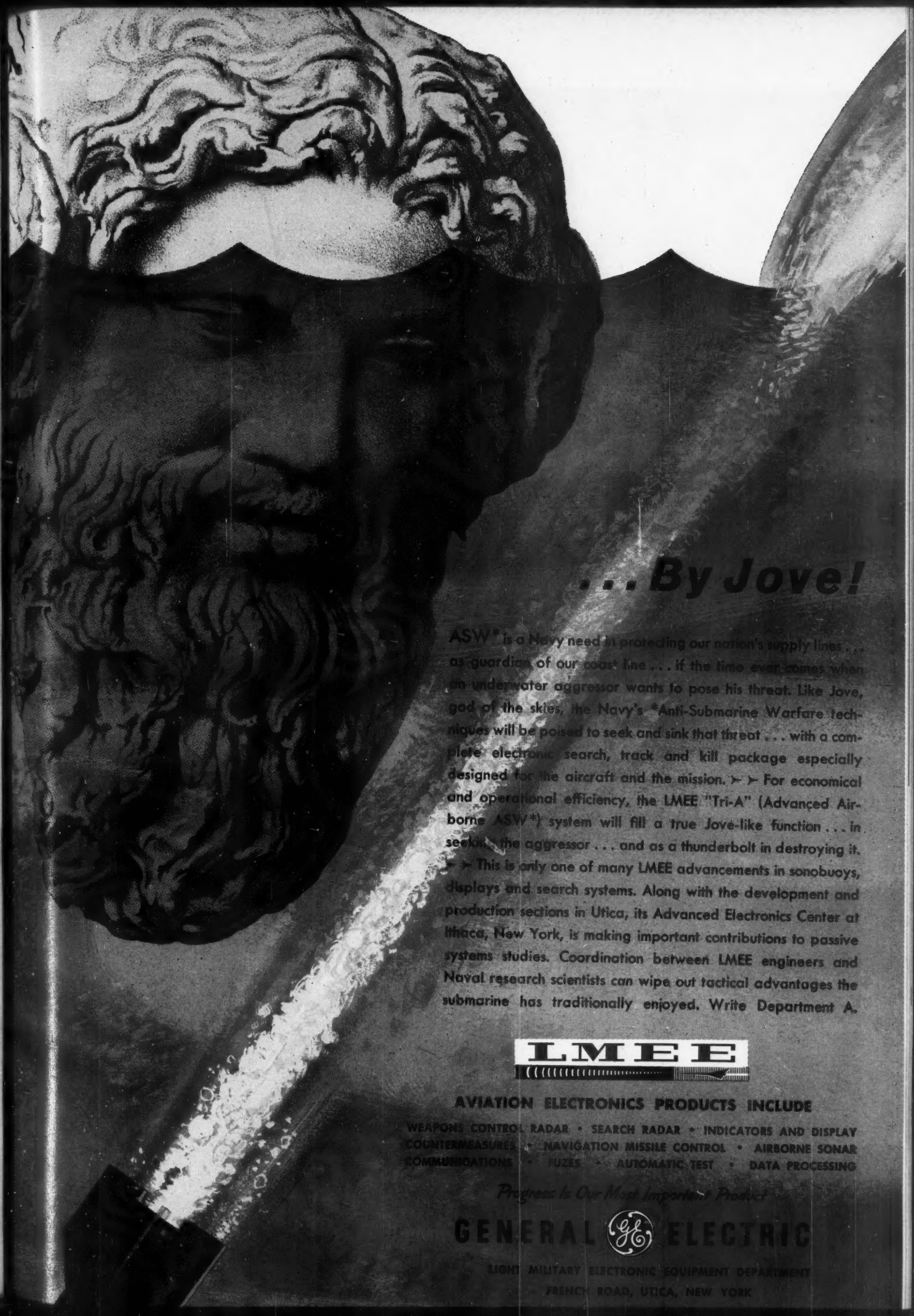
Even so, *Airpower: The Decisive Force in Korea* is a volume that every professional airman—military and civilian—will want to own and read. It is an authentic study of modern air war by the men who fought that war. A number of combat air photographs add to the value and interest of the book. The informed layman will find this volume one of the few understandable accountings of the USAF in action, and of the air concepts, doctrines, tactics, and strategy by which the USAF conducts modern war from the air.

• • •

Three practical guides promise the active and Reserve officer and airman a treasury of information about service life and duty. The tenth edition of the *Air Officer's Guide* ($5), is an encyclopedia of facts every officer should have at his fingertips. Starting with a brief chronology of Air Force history, it runs through twenty-nine chapters that touch on every significant area of military duty, knowledge, custom, and life. Airmen will also find useful its general information on the Air Force, on AF bases, housing, and schools. While not quite so personally aimed, *The Airman's Guide* ($3), becomes a professional bible for grades from basic airman to "three-up, three-down." A third handy, useful, pocket-sized volume, *Air Force Drill and Related Training* ($2.50), is essentially a paraphrased condensation of many official AF pamphlets, instructions, etc. It covers drill and command, ceremonies, leadership, discipline, courtesy, customs, hand weapons, security, and air base defense. All three are Military Service Publishing Company books.

• • •

Reference and research choice: During the past year numerous aircraft documentaries appeared in a variety of sizes, formats, and presentations. All are British originals, available in your local bookstore or through the American publisher or distributor. Especially instructive to air crews, air defense personnel, and ground observers, are three aircraft recognition books. In pocket size and with hard covers, *The Observer's Book of Aircraft,* by William Green and Gerald Pollinger (Frederick Warne, N. Y. & London, $1.25), contains photos and three-view silhouettes of the world's latest military and civilian aircraft with data on dimensions, performance, armament, and development history. *World Aircraft Recognition Manual,* by C. H. Gibbs-Smith and L. E. Bradford (John de Graff, N. Y., $3.50), is designed for rapid identification reference. It is arranged so aircraft fall into four categories by wing shape—delta, swept, straight, and rotary. Three- and four-view silhouettes and photos accompany brief backgrounds on 240 military and civil aircraft. *The World's Fighting Planes,* by William Green and Gerald Pollinger (Hanover House, $3.50), is a handy pocket manual featuring nearly 500 photos and silhouettes of bombers, fighters, transports, trainers, and helicopters of air forces of every country on the globe. It embraces the latest military jets and the combat aircraft of World War II that are still in active operations somewhere today. Brief histories, dimensions, performance data, and armament are included.—END



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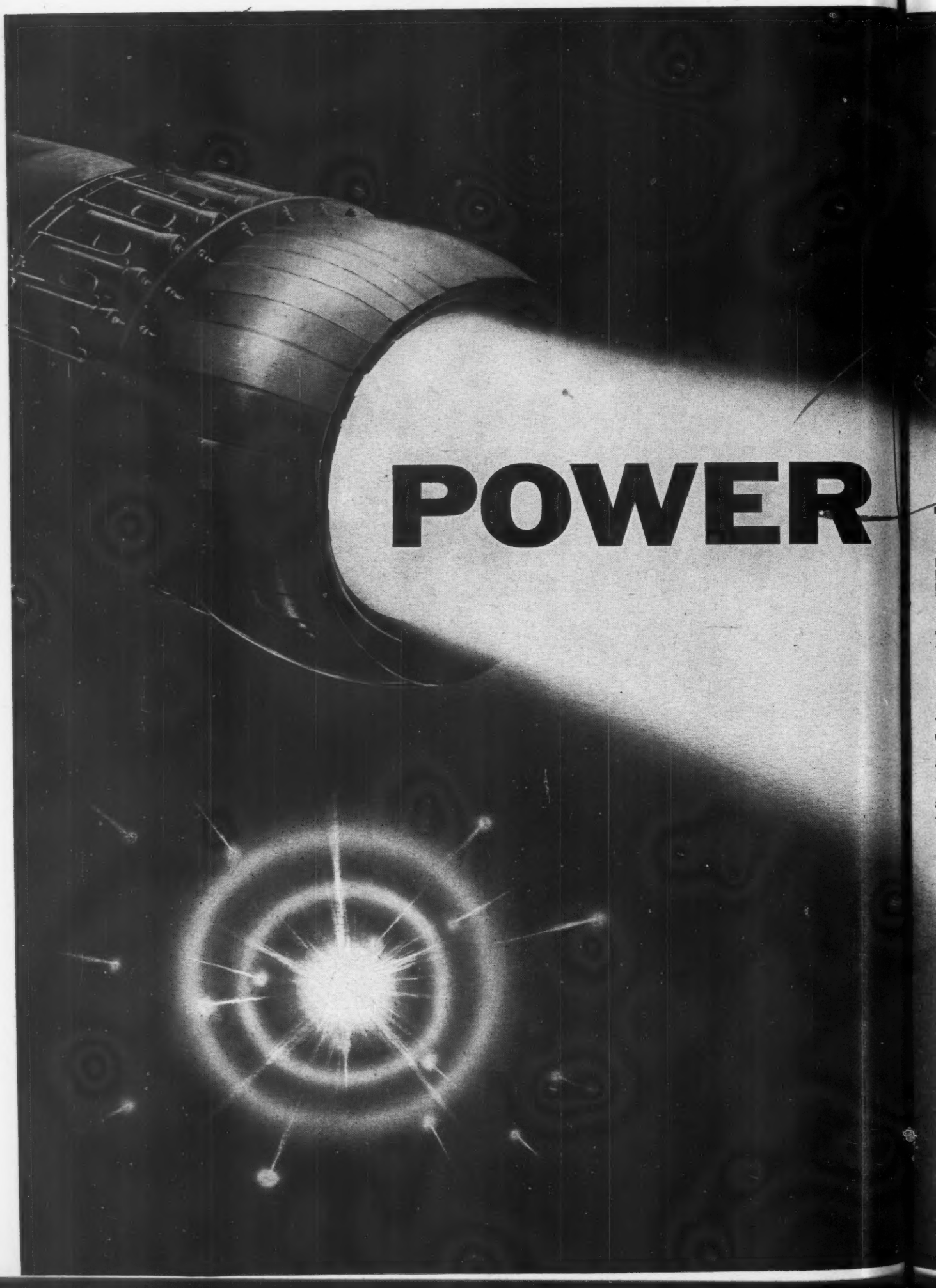
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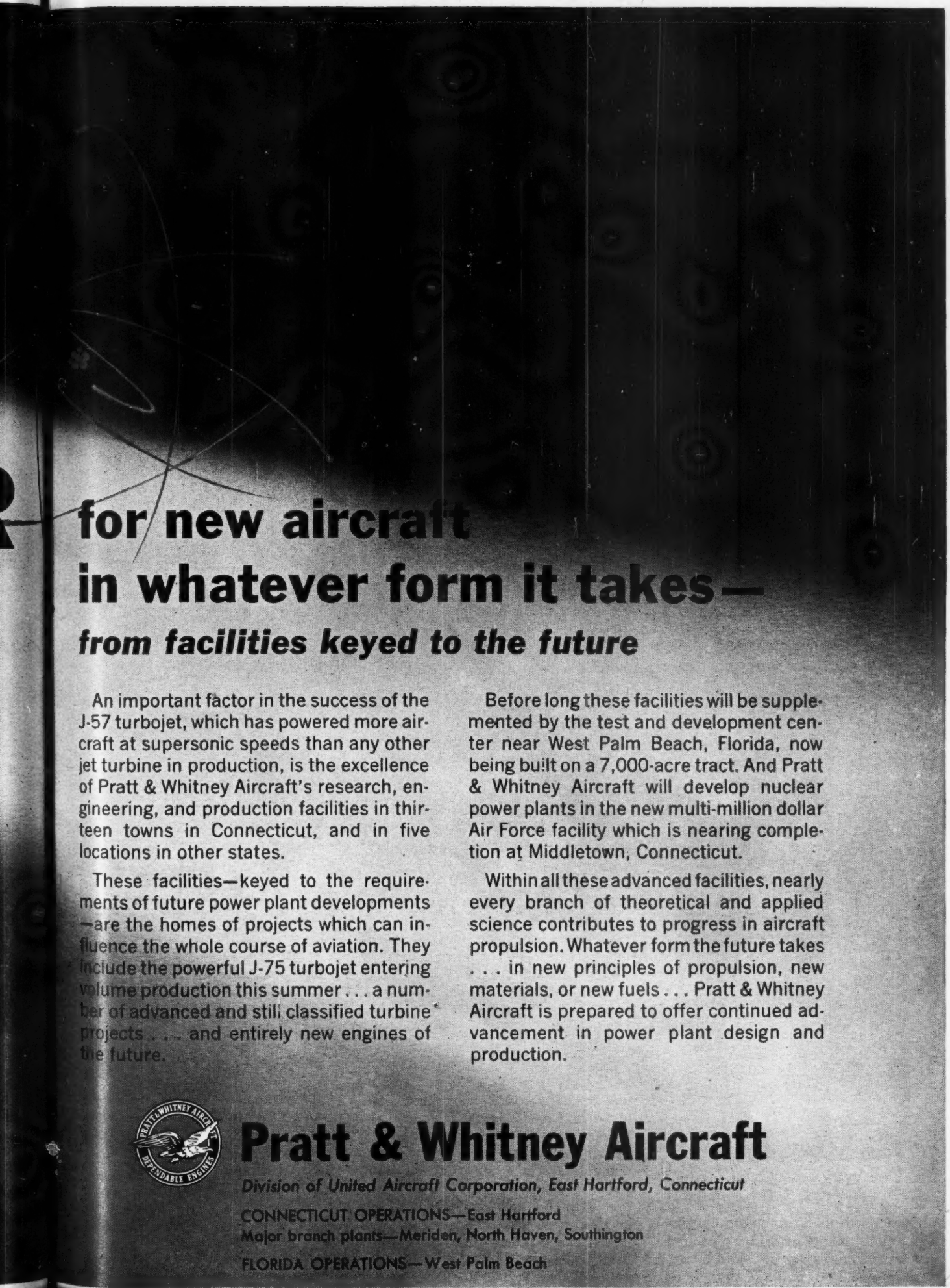

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Before long these facilities will be supplemented by the test and development center near West Palm Beach, Florida, now being built on a 7,000-acre tract. And Pratt & Whitney Aircraft will develop nuclear power plants in the new multi-million dollar Air Force facility which is nearing completion at Middletown, Connecticut.

Within all these advanced facilities, nearly every branch of theoretical and applied science contributes to progress in aircraft propulsion. Whatever form the future takes . . . in new principles of propulsion, new materials, or new fuels . . . Pratt & Whitney Aircraft is prepared to offer continued advancement in power plant design and production.

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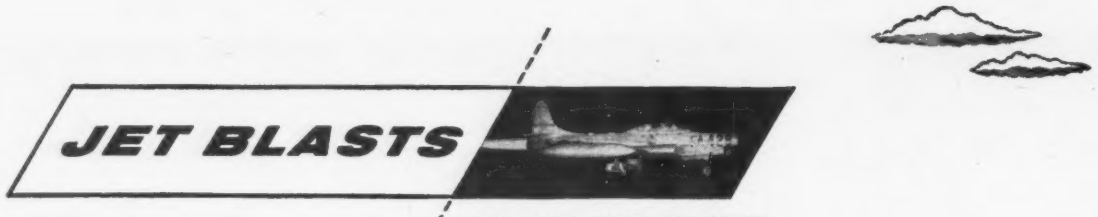

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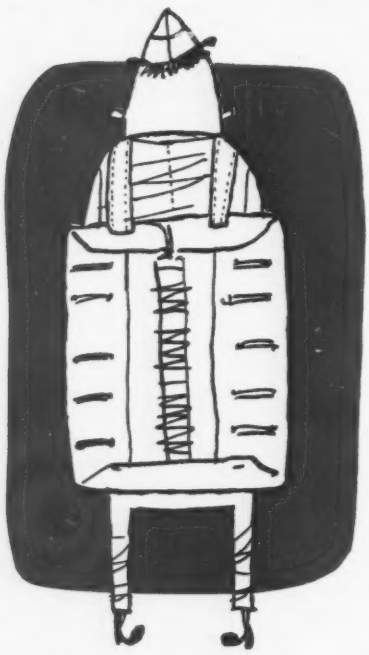
In "Jet Blasts" you can sound off on any subject you want. We'll pay a minimum of $10 for each "Jet Blast" used. All letters must be signed but we'll withhold names on request. Keep letters under 500 words. "Jet Blasts" from service personnel do not necessarily report official policy.

Discipline Is a Mighty Fine Thing, But . . .

My attention was drawn to the article in your March issue by Maj. Gen. H. K. Mooney entitled "Helpful Hints for Air Force Living."

I most certainly agree with all he said. As a graduate of Randolph Field, Tex., Class of 42B, I recall much of the good breeding training. All who graduated from Randolph, the "West Point of the Air" in those days, seemed to feel pretty much the same: proud, well disciplined, good soldiers and cadets, ready for advanced school at Brooks or other fields.

However, as flying cadets, I particularly noticed that as soon as we marched stiffly to the flight hangars and dispersed to our separate small flights (four to six cadets per instructor), we were carefully instructed by our lieutenant to "relax and leave the upperclassmen and the barracks area drill right back there." We were reminded that we were there to learn to fly, and the instructor was going to do his level best to teach us that little trick. It figured. We were dressed in



highly "irregular" fatigue suits anyway, and in those parachutes we made messy looking future officers.

For me, Brooks followed Randolph Field, where, on December 7, 1941, we first learned there was a place on the map called Pearl Harbor. At Brooks we again noticed that when we Air Corps Flying Cadets got down to the business we were there for—namely, learning to fly—we were in another world from that of the "neckwear, cuff, blouse, and hats tilted" world General Mooney writes about. Were we ever glad! But, of course, we had to be mighty careful not to let any of that airplane and flight-line familiarity stick to us when we got back to the "tac" officer's bailiwick. I feel sure all the fly boys today experience the same thing.

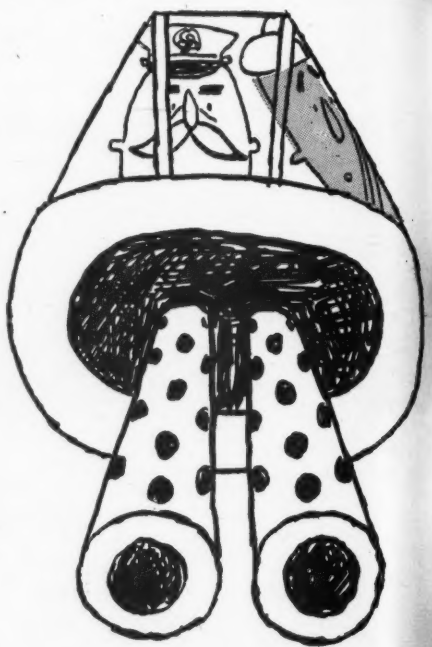
Well, to carry the thing a little further, as I read General Mooney's article, I couldn't help reflecting. The war has been over in Europe now some eleven and one-half years. But it is not forgotten by those who fought in it. Time heals a lot of wounds, though, and, seen in retrospect, many a serious if not tragic occurrence can become a source of humor.

If that be so, then that is exactly the way that article of General Mooney's struck me. And suddenly my mind conjured up the specter I wish to describe in greater detail. (I felt this preamble necessary in order to make it clear I in no way wish my words to be misconstrued.)

As one of the first four bombardment groups to become the nucleus of the Eighth Air Force, we who flew the '17s soon learned a camaraderie quite unprecedented, I believe, in the United States armed forces. The flight crews of the Air Force were disciplined all right. But the discipline acquired a peculiar form. It was a discipline of mind and coordination of the body the pilots had drilled into them in those hours of training, holding formation, paying attention to the many, many details of flying that then-complicated machine, and then taking that discipline up into the air high over enemy-occupied France and Germany herself, facing the best fighters in that part of the world, suffering wounds and battle damage, and still maintaining that discipline.

I now find myself trying to apply the General's "hints" to those situations so many of us found ourselves in over Germany. I found myself laughing at the absurdities of applying his hints at such times.

Take the paragraph on "Deference," for instance. "In automobiles the senior sits on the right of the back seat." That would make it real cozy for the tail gunner. Imagine the general in the lead plane, or even the colonel, crawling back into the tail of a '17



and the nonplused tail gunner trying to find room on his right for the senior officer!

"He is the last to enter and the first to leave." In German prison, where I landed on my twenty-fifth mission, we heard the story of a general who left rather early from one burning plane, even to the unforgivable detail of forgetting to hook his back pack 'chute on! It could, and probably did, happen to many others. But I hasten to point out, deference didn't cut much ice with men hurrying to get out of a burning

(Continued on page 33)

FLYING FIRE ENGINE

The Kaman HOK-1 helicopter is famed for its versatility and adaptability to a variety of uses. Based on an actual incident, the photos below show how the HOK-1 can be used effectively as a piece of fire fighting equipment and local crash rescue vehicle.

1. Simulated crash consists of a scrapped plane soaked with aviation gas and jet fuel.

2. Carrying a pilot and three fire fighters, the HOK hovers over fire fighting equipment while ground crewman hooks it to the ship.

3. Flying to the crash scene, the HOK hovers and sets the fire apparatus on the ground automatically.

4. The helicopter lands near the equipment and discharges firemen who begin immediately to unreel the hoses.

5. Hovering over the flames, the HOK uses the powerful downwash of air from its rotors to beat down the fire. Firemen go into action.

6. Mission is accomplished as chemicals open path for the rescue of the "pilot." Elapsed time from arrival on the scene — 45 seconds!

Kaman's continuous research is helping to keep our National Defense effort strong.

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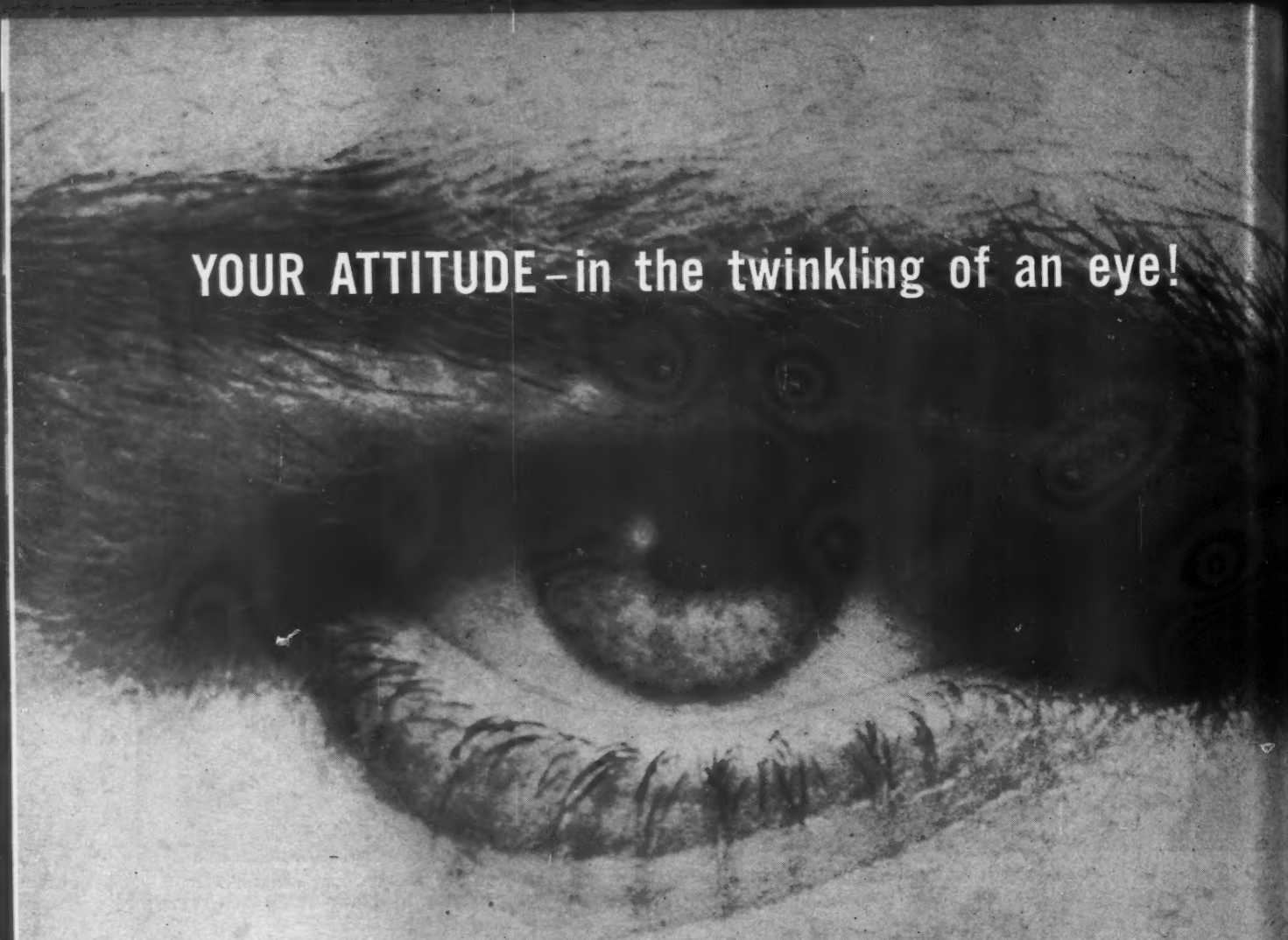

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WITH INTERNAL LIGHTING

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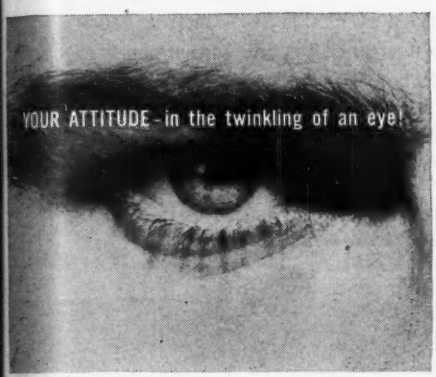
MARS

Master Attitude Reference System

Developed in cooperation with Wright Air Development Center



The new Lear MARS is a light weight pictorial attitude reference system whose exceptional accuracy makes it highly applicable to all supersonic, subsonic, and helicopter aircraft types. It is an all A-C system and available with either 3-inch or 5-inch indicator.

MARS FEATURES:

INTERNAL LIGHTING—Unique Lear internal lighting eliminates pilot blinding glare, stray light, canopy reflections and protruding fixtures. Translucent background sphere and indices glow uniformly with red light.

INTEGRAL TRANSISTOR AMPLIFIER—Hermetically sealed indicator contains miniaturized amplifier which operates directly from standard synchros. Silicon transistors and printed circuitry provide unequalled miniaturization, improved reliability, and low power consumption.

MASTER REFERENCE—Remote mounted MARS control can also serve as master reference for other systems requiring an accurate vertical reference.

PERFORMANCE—New steel gyro and system design innovations provide marked improvement over previous systems in sensitivity, accuracy, reliability, and life. Very short initial erection cycle facilitates fighter scrambles.

PACKAGING—If indicator mounting space is critical, the integral amplifier may be packaged separately, thereby shortening indicator length to 6 inches. Remote rate gyro package provides further installation flexibility.

ACCEPTANCE—MARS will be standard on such new aircraft as the Lockheed F-104, Chance Vought F8U-1, and Sikorsky HSS-1.

For detailed product data sheets, write to the Grand Rapids Division, Grand Rapids, Michigan.

LEAR

bomber. (Do you suppose that was why my navigator sat by the escape hatch, ominously and terrifyingly open at over 8,000 feet, that thirteenth day of April 1944? The thirteenth . . . maybe that had something to do with it! Anyway, Pat crouched by that whistling no-return hole and sort of motioned me toward it. Imagine us playing Alphonse and Gaston at a time like that. But we were *both* first lieutenants.)

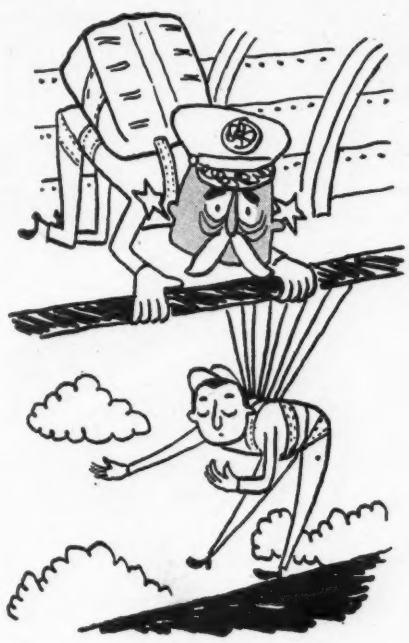
Again, "It is more fitting for a goat than a commissioned officer in the Air Force to chew while in formation." WOW. We not only chewed gum while in formation, we SMOKED. At lower altitudes, of course, since we were BP (before pressurization).

"It is all right for a Boy Scout to hang accessories on his belt, but an Air Force officer should not." Now that I'll buy. . . . For some undisciplined reason,when I prepared to bail out on the aforementioned day, I carefully tucked my garrison hat under my belt. Guess I thought I'd look more like a leader when I was being counted by the Jerry guards. General Mooney would have chuckled—the hat blew away as soon as I hit the air.

"An excellent way to become unpopular is to hog the conversation and tell long pointless stories." Forced to agree here, too. I recall one day I had to fly the tail position of the lead airplane. My duty was to keep the higher brass up front apprised of the formation's condition to the rear. On our way out of France we were tailed by some highly mobile flak. We weren't going nearly fast enough to make me feel good. So I kept up a fairly constant stream of information over the intercom as to the sickening proximity of the aggravating stuff. Finally, I heard an exasperated voice drown out my informative little monopolistic discourse with hushing finality—"Somebody throw that tail gunner out!" Yes, I must agree with the General there . . . hogging the conversation *is* an excellent etc., etc.

"Others" (of the do's and don'ts) "are based on common sense and good breeding." Somewhere, somehow, up there at five or six miles above the enemy flak guns, in the thirty to fifty degrees below zero, we shelved our good breeding for a lower form of common sense. With no other facilities available on most '17s, some of us well-bred pilots were forced to resort to compromising methods. I refer specifically to the times mother nature called imperiously—in her milder form, to be sure. My reluctant reply was a grab at the old tin helmet, concave side up. It followed, as the night the day, my long-suffering flight engineer had to play chambermaid and get the tin hat back (not too much the worse for wear) as soon as possible for further use as primarily intended.

"Walking in step. Adjust your stride to your senior and he will meet you halfway." Can't you just see a sergeant or a looey, the plane in flames, everybody crowding the escape doors and hatches, stepping back on the eight-inch catwalk in the bomb bay of a '17, bomb doors open, the wild, cold wind shrieking, and bowing gently as he attempts to get on his left? "After you, Sir," the sergeant



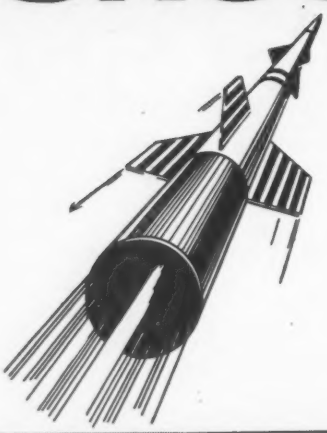
says, as the wind prematurely opens his parachute and wafts him away right before the disbelieving eyes of his senior officer.

Let us hope we do not have another war where we may again "unconsciously slip into bad habits." With the highest respect for the intent of the article, I close, hoping that some other Air Force graduates may have got a laugh at the small sample of real situations which in the light of time have, to me, made somewhat incongruous the helpful hints for Air Force living.

—THOMAS PAXTON SHERWOOD

Born in 1914 in Pennsylvania, Mr. Sherwood was graduated from Penn State College in 1937, entered the AF in 1941, and flew twenty-five combat missions from England. Shot down over Schweinfurt, he was a POW for thirteen months. He is married and now lives in Johnstown, Penna.

THIS IS
GROUND SUPPORT !



The complex requirements of missile and piloted aircraft mean constantly stricter demands of ground support equipment. In this field, CONSOLIDATED has developed a wide range of single and multi-purpose units designed for both missiles and piloted aircraft. The compact Model 2100, for example, a self-propelled multi-purpose unit . . . . performs every function of electrical hydraulic and pneumatic testing . . is capable of servicing and starting guided missiles and jet air-craft quickly, surely and under the most difficult operational conditions . . . and can be used for heavy duty towing as well. It provides:

- **HYDRAULICS . . . 10 GPM, 3000 PSI variable volume, pressure compensating.**
- **TOWING . . . All wheel drive, over 5000 lb. drawbar pull.**
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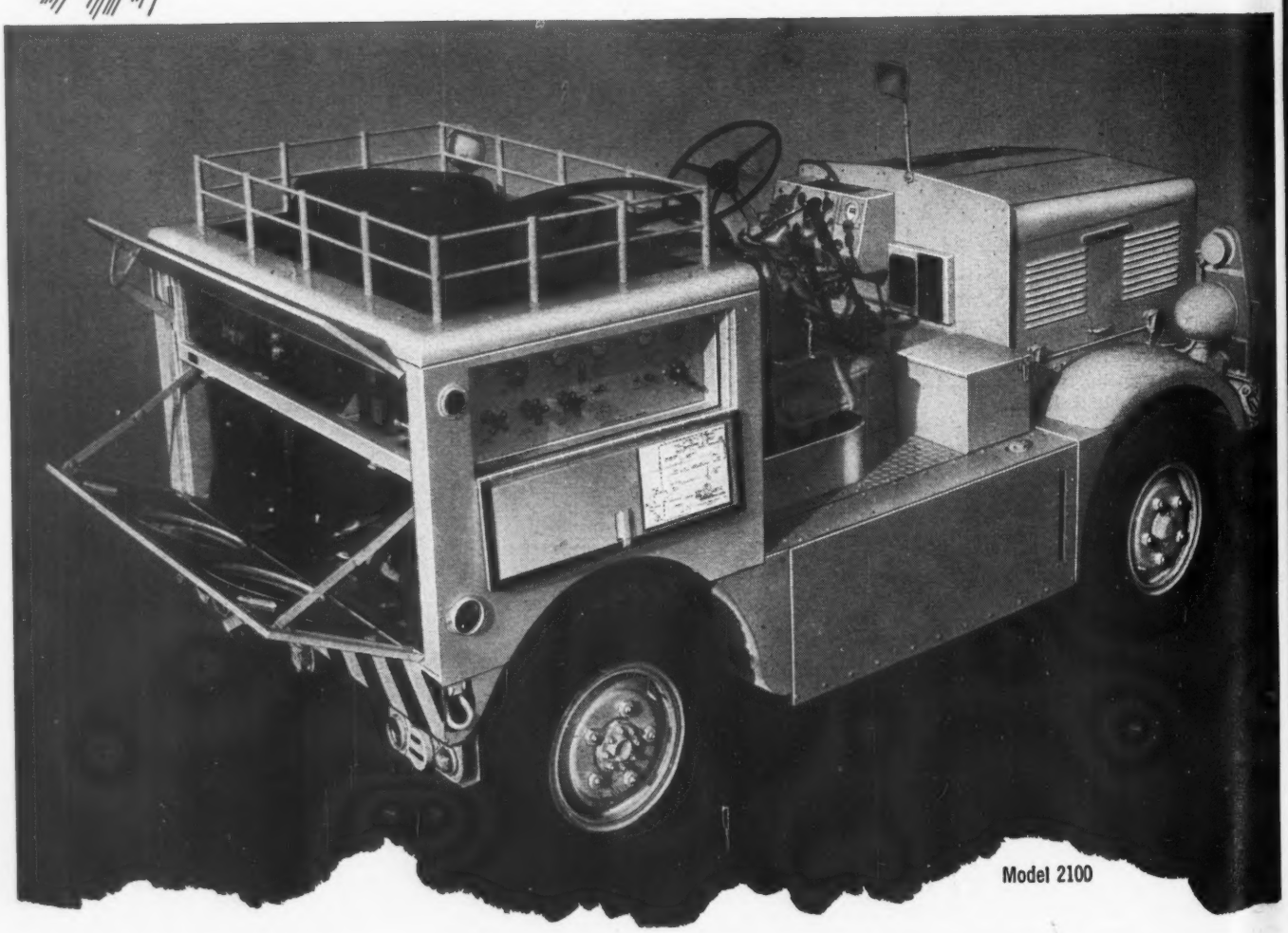

Model 2100

OTHER MODELS OF SINGLE AND MULTI-PURPOSE GROUND SUPPORT EQUIPMENT ARE in active use with U.S. Air Force, Navy and Marine Units . . available with any combinations of . . AC and DC power . . high pressure air, hydraulics, and low pressure air . . refrigeration and heating.

CONSOLIDATED'S resourcefulness in solving the most challenging problems in the design and manufacture of ground support equipment attests to its ability to develop specialized units to fit your individual needs.

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SHOOTING THE BREEZE

WITH THE EDITORS OF AIR FORCE MAGAZINE

A short guest editorial from the Portland *Oregonian*:

"Ever since the first atomic bomb dropped in combat exploded over Hiroshima, military authorities have been speaking of pre-atomic era armaments as 'conventional.'

"As the world's armed forces modernize, they necessarily become less 'conventional.' Rockets, guided missiles, all other new developments are presumably beyond the line of established, accepted, traditional usage.

"We dare say that gunpowder was once considered to be unconventional. The crossbow, too, was a departure from conventional arms. The question is: Just how long need a weapon be in the arsenal to graduate to the 'conventional' class? Unfortunately, the 'unconventional' weapons—or at least the means to them—are here to stay."

☆

According to a Chicago "Tribune" report, it need not take a Cordiner Committee to make an airman happy. Thanks are due, says the "Tribune" correspondent, to the hospitality of British girls who like Americans so much that one out of every eight airmen stationed in Britain takes home an English bride.

☆

A fighter-interceptor squadron at Oxnard AFB, Calif., has come up with a new kind of solution to the jet noise problem. Col. Edwin Carey, squadron commander, had been plagued with calls from irate mothers whose children had been awakened by his jets. Now, when such a complaint comes in, it is suggested that the mother talk with the same pilot who had caused the noise.

If the mother is agreeable, the pilot calls at the home dressed in his best uniform, admires the baby, and, over coffee, explains the air defense mission.

"Generally," says Colonel Carey, "the Air Force can chalk up another friend."

☆

Active AFA support of the Air Force recruiting program was graciously acknowledged in a recent issue of "The Air Force Recruiter," house organ of the 3500th USAF Recruiting Wing. The editorial said, in part, "We are extremely fortunate in the support of the Air Force Association. . . . Active AFA support of our mission opens many new avenues, never before explored or exploited, along which we can send our message to the American people."

☆

AFA's peppery Gen. George C. Kenney was in the news not long ago with a blistering speech saying that the "Red dictators must be expelled from the United Nations . . . must be called upon to resign, hold free elections supervised by the UN, and disarm."

Whereupon Moscow's *Isvestia* blasted back that General Kenney was a "high-ranking lunatic" and that "most lunatics are harmless, but Kenney is a violent and dangerous lunatic" who should be placed in a strait-jacket because "that's all science can do for George Kenney at the present stage of its development."

General Kenney said he was flattered to be called a "high-ranking lunatic" by the Russians and, in typical Kenneyese, went on, "As long as I'm on their honor roll I'll feel very flattered and I don't care how high or low I'm ranked. Anywhere from first to tenth will be all right."

☆

A New York "Herald Tribune" dispatch from Moscow says the Soviet Union has started a vast civil defense program, with plans to enlist "millions" of women for part-time air-raid defense plus a mass educational campaign.

☆

Apropos the business of unification, an account of a sociological experiment at a boys' summer camp, as recounted in *Scienific American*, bears a second look. In brief, the experiment went something like this:

(Continued on following page)

This month's Breezecake girl was sent to us with the compliments of Bill Key, Assistant to the President of the Fairchild Engine and Airplane Corp. Bill Key, private citizen, suggests she's the girl anyone would most like to survive with. William G. Key, Assistant to the President, etc., points out that the floating object is a Fairchild Armalite AR-5 survival gun, which weighs 2½ pounds and floats. The girl weighs more than that, but floats, too. No one seems clear who the ducks belong to, or, for that matter, why they're even included in the picture.

1. First the boys were kept all together, in a single group performing a common task. They quickly formed "best friendships" and worked together in complete harmony.

2. Next, they were split into two groups and given competing tasks. The two groups began to hate each other, and the "best friendships" were ruptured. The boy who treated the other group the meanest possible way became a hero to his own group, even though he had been considered a bully when all of the boys had been working together.

3. Third, the boys were brought together again in purely social contacts. The ill feeling between the groups persisted.

4. Last, they were once more given a common task to do and the old unity was quickly established.

☆

A friend of ours in New Rochelle, N.Y., sent along an intriguing exchange of correspondence dated May 5, 1941, and consisting of a copy of an Unsatisfactory Report with indorsements thereto. Somewhat abridged, it goes like this:

"1. While cruising at 6,500 feet on a routine night flying mission in B-23 airplane A.C. No. 39-62, the following described difficulty was encountered: Immediately after passing over the Spokane Radio Station Cone of Silence and entering the westerly "A" quadrant, said airplane had a direct head-on collision with a one-pound, twelve-ounce specimen of *Aves Aquavinius Quackus,* more generally known as a bluebill duck. As far as could be determined, said duck was flying east directly on the beam and without passing or riding lights of any kind, thus giving the pilot absolutely no opportunity to duck the duck. The immediate result of the accident was the appearance of a hole in the starboard windshield approximately six inches wide, and directly above the pilot's head. Following which the wind blew and the duck flew into the cabin. After a short delay during which the pilot was separated from the duck and the ship's engineer tied in his seat, a deferred forced landing was made at the Spokane Airport. Upon examination after landing, the duck was found to be dead, subject demise being apparently due to suffocation caused by its head being driven through its tail empennage.

"2. Duck was not carrying a logbook, consequently flying time is unknown.

"3. Number of subject items known to be defective—What is left of one (1) duck.

"4. It is recommended that:

"*a.* The Civil Aeronautics Authority set aside a prescribed level for the flight of migratory waterfowl, and that closer vigilance be maintained in the training of ducks, etc., in the use of that level for cross-country work. Also that even when using prescribed level, ducks be equipped with proper night-flying paraphernalia, i.e., passing lights, landing lights, M-3 flares, etc.

"*b.* It is also recommended that duck part number B-63429 (Aperture Below Horizontal Stabilizer) be reinforced with a ring of armor plating, thus preventing subject part from slipping over the neck and bill in future collisions and so avoiding future deaths due to suffocation.

"5. Result! Duck was beyond local repair. It is being held at this station pending instruction from higher authority."

The indorsements referred the matter to the Operations and Maintenance Section of the 19th Signal Aviation Company, with the following comments:

"1. It is believed that this bird may be No. 43-8164, reported missing from your loft on 4 April and that unfamiliarity with combat equipment resulted in improper identification.

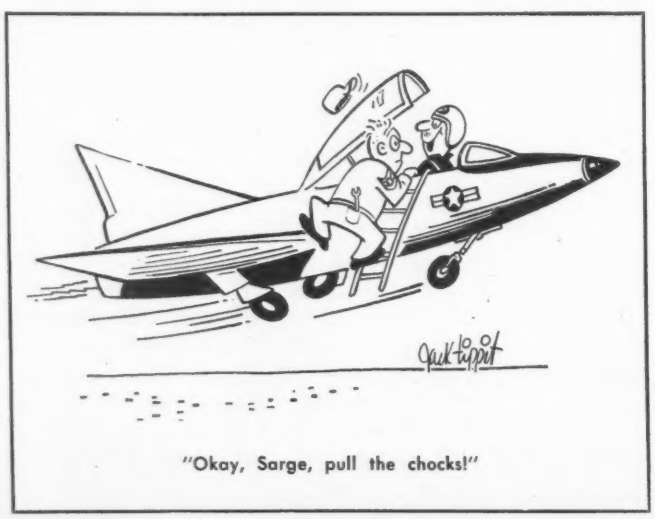
"2. Request information as to:

"*a.* Why 164 was not using his radio equipment?

"*b.* Who cleared 164 for flight outside theater?

"*c.* Why 164 was not wearing his bird dog tags?"

The ultimate disposition of the case is not known.



"Okay, Sarge, pull the chocks!"

☆

Maj. Gen. H. K. Mooney's article, "Helpful Hints for Air Force Living" in our March issue, got an enthusiastic response from Air Force audiences. To date dozens of requests for permission to reprint have come in from AF units, large and small, and from Military Service Publishing Company's "Air Officers' Guide."

☆

A few of the legal problems that space flight might entail were recently raised by P. K. Roy, Director of the Legal Bureau, International Civil Aviation Organization. Suppose, for example, that a couple on a space ship fall in love and wish to marry before they come down to earth.

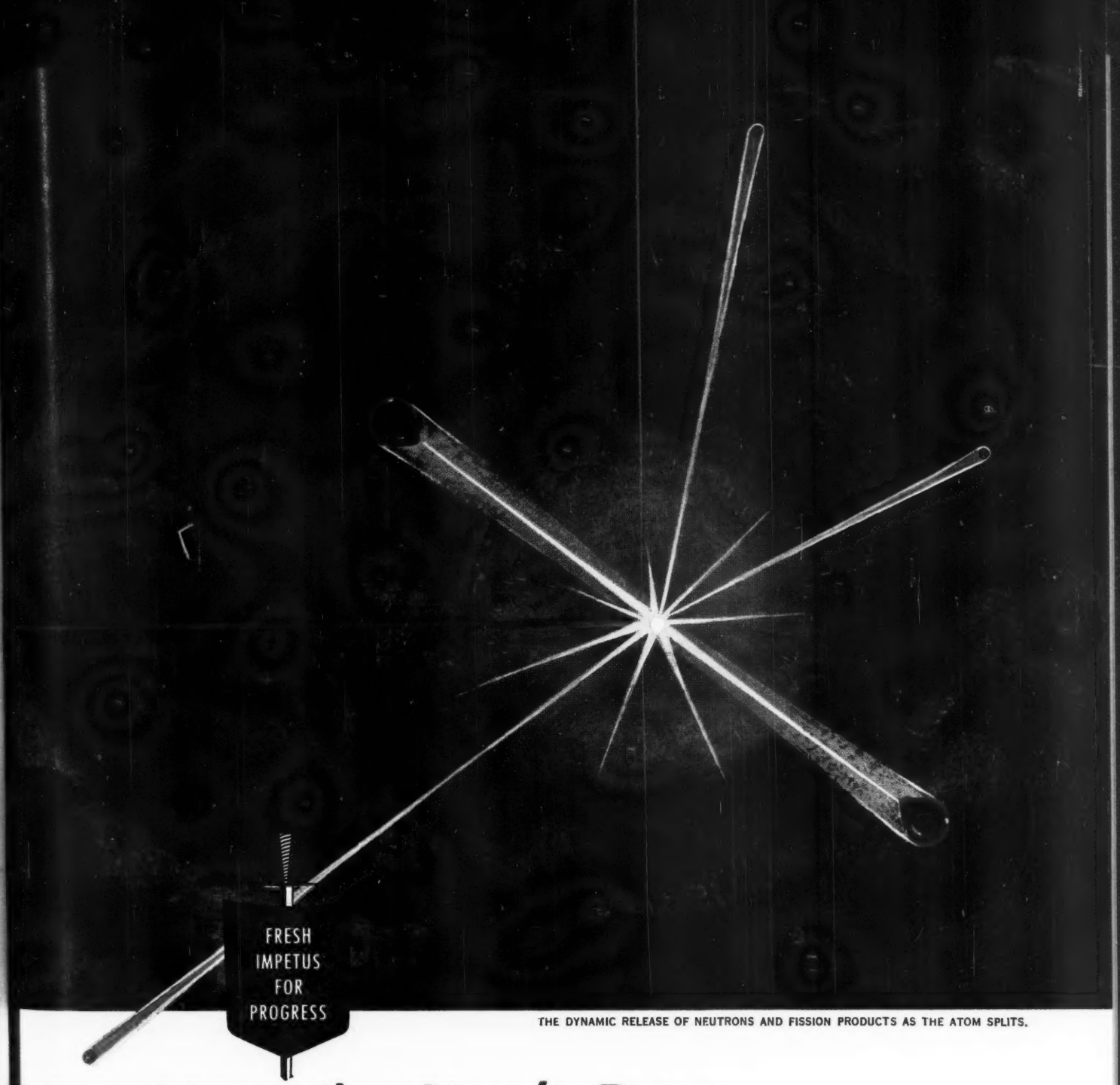
(Continued on page 41)

Lighter than Air

While he was teaching a group of cadets in a weather class here at Spence Air Base, one of the instructors was discussing the composition of the atmosphere. Dutifully, the instructor named the various gases: "Nitrogen, oxygen, carbon dioxide, hydrogen, argon, neon, and so on."

A puzzled French cadet put up his hand. "Sir," he said, "I've heard of all the gases you mentioned but the last one. Tell me, please, what kind of gas is 'So-on'?"

GEORGE J. GOULETTE
Director of Academic Training
Spence Air Base
Moultrie, Ga.



THE DYNAMIC RELEASE OF NEUTRONS AND FISSION PRODUCTS AS THE ATOM SPLITS.

Unleashing the Atom's Power

Canadair has long been associated with the Government of Canada in the development of nuclear programmes. In its role of designer and builder of specialized research equipment, the company has successfully undertaken projects of considerable size and complexity . . . helping to unleash the atom's power for peace.

The experienced Canadair team of nuclear physicists is available for consultation with scientists or industries to study and specify how nuclear knowledge can be applied in any field: generation of heat and power—medicine—agriculture—metallurgy or general industry.

Inquiries are particularly invited from universities, laboratories and industries. Write to the Nuclear Division, Canadair Limited, for the book: "Canadair in the Field of Nucleonics."

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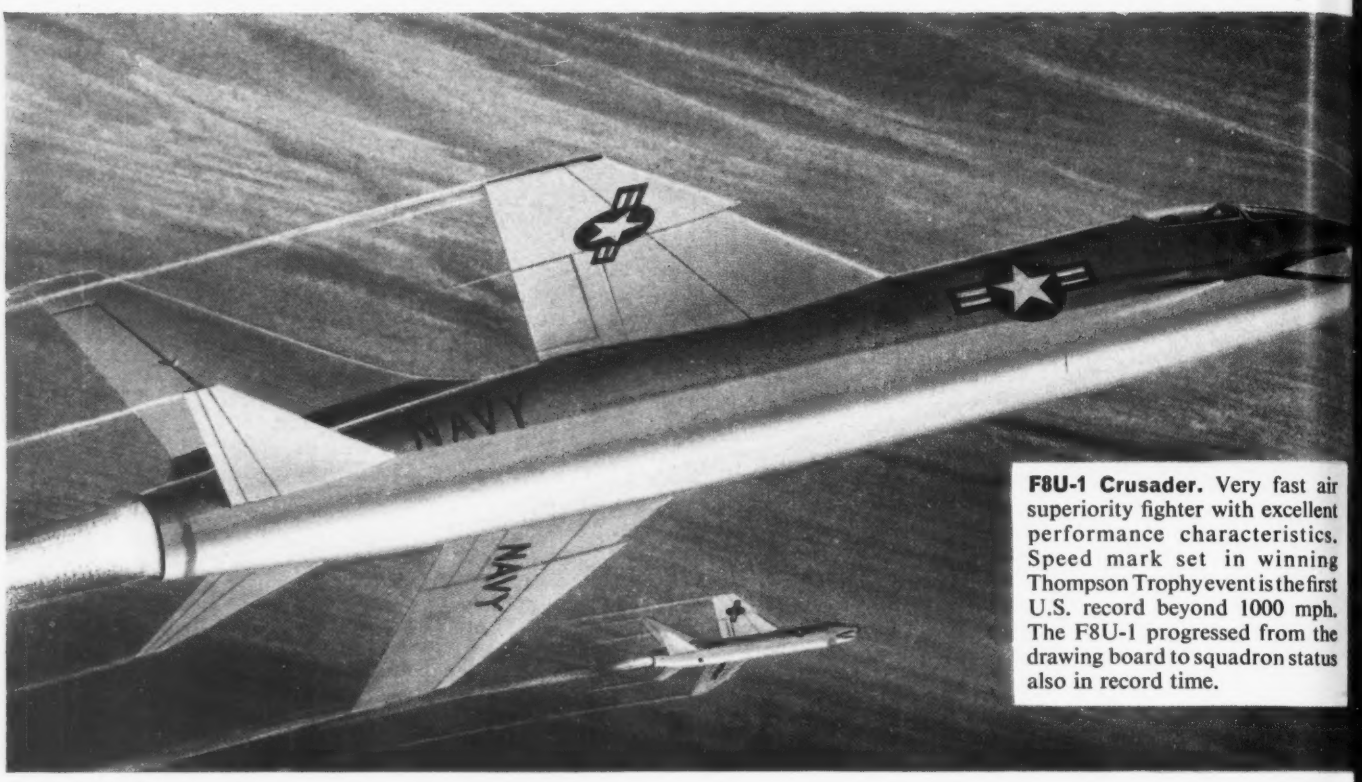


F8U-1 Crusader. Very fast air superiority fighter with excellent performance characteristics. Speed mark set in winning Thompson Trophy event is the first U.S. record beyond 1000 mph. The F8U-1 progressed from the drawing board to squadron status also in record time.

Things move f

Facilities. The modern Vought plant is equipped with the newest scientific tools for advanced research and development work. These facilities, combined with Vought capabilities, and complete systems experience, successfully meet the challenge of complex jet-age production.

Engineering. Engineering excellence is essential to the success of any aircraft manufacturer. Traditionally strong in this area of its operation, Chance Vought has long and successfully filled the role of a pioneer, with a long list of design "firsts" attesting to its engineering vision and ingenuity.

Achievements of the past 33 months accentuate a 40-year record of outstanding leadership.

On July 1, 1954, Chance Vought became an independent manufacturer of military aircraft and missiles. The aviation experience logged by the company since its inception in 1917 was both a background and a springboard for the "new" organization. Management structure was strengthened. The pace of R & D was stepped-up. New ideas were given wings. Here, briefly, are some of the results:

The record-breaking F8U-1 *Crusader* made its first flight 9 months after Vought began independent operations. It was ordered into quantity production 5 months later. In the spring of 1956, the *Crusader* finished carrier suitability trials...and then a production line model, combat-equipped, went on to set a new U.S. speed mark in winning the Thompson Trophy. The *Crusader* is now in squadron status, serving with the U. S. Fleet.

At the same time, the *Regulus I* project took rapid strides forward. Eight years of previous Vought missile experience paid off in 1955 when *Regulus I* became operational with the Fleet. On station and ready-to-go during two recent international flare-ups, *Regulus I* proved its capabilities and versatility in successful launchings from carriers and submarines. One particular *Regulus* missile, a training and test vehicle, set a remarkable reliability record, flying 16 test missions.

And now, a supersonic new missile, *Regulus II*, is in "hardware." The new missile has completed a large number of test operations, and has been placed in production ahead of its original timetable.

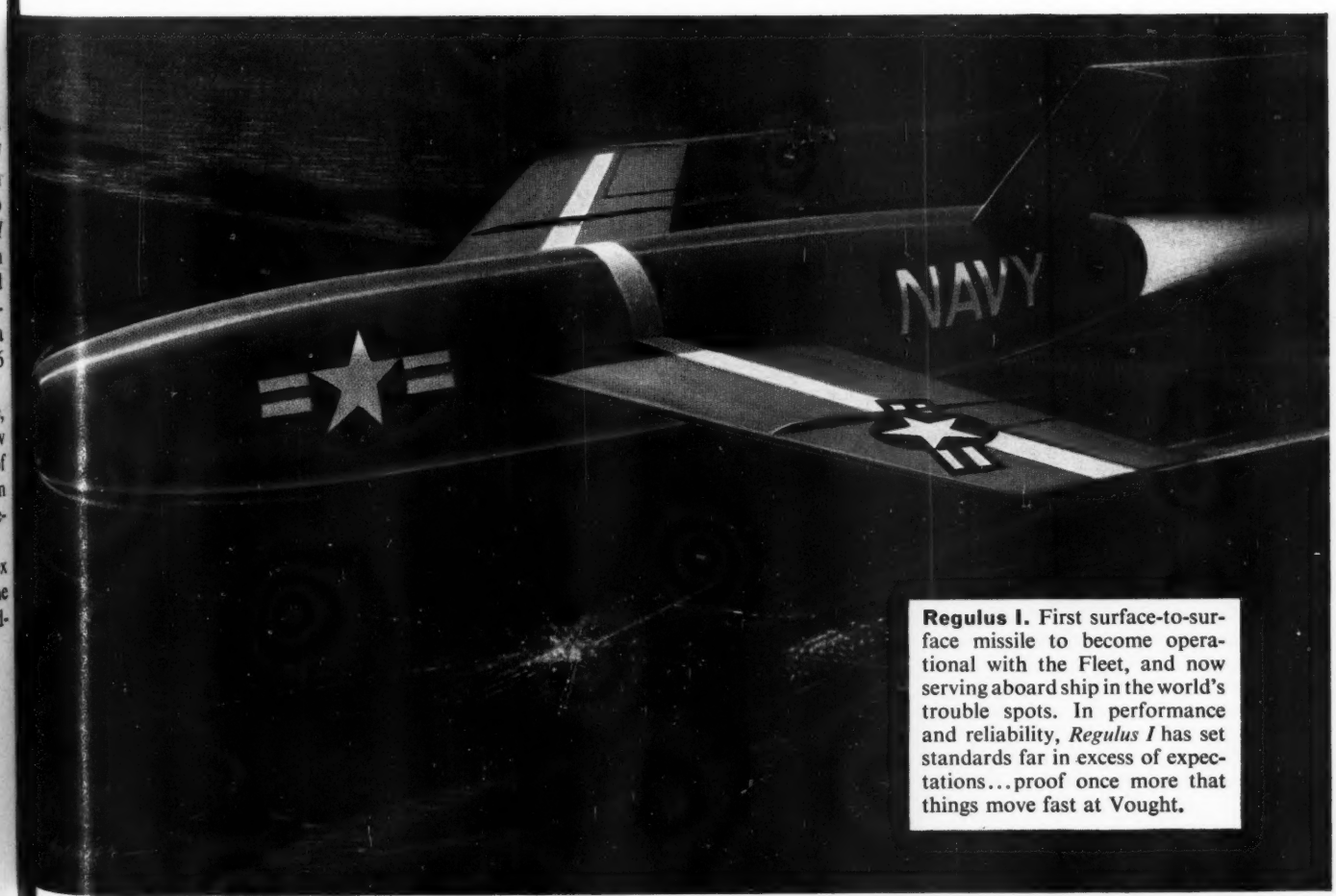
The schedule status of these complex systems projects is on record. So is the high quality of performance. More advanced projects now in work will continue these standards. Yes...*things move fast at Vought.*

BUILDERS OF MILITARY AIRCRAFT 40th ANNIVERSARY 1917 TO 1957

CHANCE VOUGHT AIRCRAFT
INCORPORATED · DALLAS, TEXAS

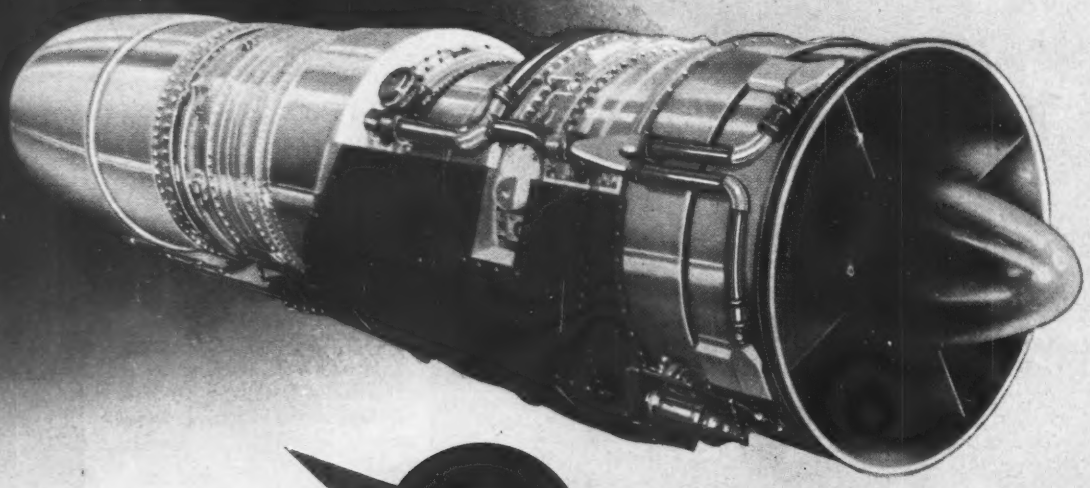
Regulus II. New supersonic, longer range version of the highly successful *Regulus I.* Can be launched from carriers or submarines. Now in production, this high-performance new "bird" is another Vought project that is ahead of schedule, proving again that things move fast at Vought.

fast at Vought



Regulus I. First surface-to-surface missile to become operational with the Fleet, and now serving aboard ship in the world's trouble spots. In performance and reliability, *Regulus I* has set standards far in excess of expectations... proof once more that things move fast at Vought.

THE GERMAN AIR FORCE
IS THE MOST RECENT
TO SPECIFY **ORENDA...**



For a well-defended future...
IROQUOIS,
Orenda's supersonic turbojet.

ORENDA ENGINES LIMITED
MALTON, CANADA
MEMBER: A. V. ROE CANADA LIMITED & THE HAWKER SIDDELEY GROUP

Would the commander of the space ship have the same authority in the matter as the captain of a ship at sea? Or, if a murder were committed in space, under whose laws would the offender be tried? Could one make a legal will in outer space? Mr. Roy wryly concluded that, before taking off for the moon, you'd better consult a lawyer.

☆

Please, please! If you have copies of these issues of AIR FORCE, send them in. We need them to complete our own files: 1946, all issues; 1947, February, March, May, June, July, October, November; 1948, March; 1949, May; 1951, July; 1954, February, April.

☆

Dr. John Victory, Executive Secretary of the National Advisory Committee for Aeronautics, put his finger on a sore spot in government research when he testified as follows:

"When the government wants to hire brains, it fixes by law the maximum rate that may be paid in open competition with everyone else, and the result is that it cannot get what it needs because it does not pay the going price. When it wants to hire blue-collar men (laborers and mechanics), it pays the going rate."

☆

Our nomination for headline of the month appeared in the New York "Times" over a story about Mr. Quarles's new job as Deputy Secretary of Defense. It read:

"Mild Man Up In Arms."

☆

Mrs. Arthur Bailey, Duluth, Minn., doesn't have any community relations problem with the Air Defense 343d Fighter Group stationed at Duluth Municipal Airport near the Bailey home. For going on five years now Mrs. Bailey has flown an American flag from a flagpole in her yard as a salute to the jet jockeys whose roaring planes keep her awake at night. She's worn out four flags in the process, has become fast friends with the pilots at the base.

☆

Air Defense Command has published an excellent guide to its bases, specifically for the purpose of reenlisting as many prior servicemen as possible. The guide contains complete dope as to housing, schools, recreation, etc., for each of ADC's bases, stations, and unit locations. For information as to how to get a copy, write to Col. J. R. Kullman, PRT, Hq., Air Defense Command, Ent AFB, Colo.

☆

The following communication accompanied the manuscript about the Dallas tornado *(see page 60)*, in which author Al Harting explains how it all came about:

"The idea for this opus stemmed from a Straubel named Jim, Executive Director of AFA, to whom we were talking via long-distance phone when our spouse first spied the tornado shaping up out our parlor window. We shouted, 'Call you back, Jim. A tornado's coming through,' and slammed down the receiver on a properly confused friend. We called back later to give him the gory details.

"Straubel wanted to know, 'What kind of a crazy place have you sold us for our 1958 convention? And another AFA staffer, who shall remain nameless, said the 1958 slogan should be 'On to Dallas for AFA's Biggest Blow-Out.'

"To these and other brave souls, we're pleased to report that September isn't a tornado month in Texas and that, if we haven't blown over yon hairy horizon at some prior date, we will introduce one and all to blue, blue skies and to breezes just gentle enough to bare the dimpled knees of America's most beautiful girls."

(AFA's 1958 National Convention will be held in September, in Dallas, with AFA-member Al Harting serving as Convention Chairman.—THE EDITORS.)

☆

POET'S CORNER

The sky is their blackboard, the jet trail their chalk,
Horizons for windows, cloud carpets to walk,
Sun and stars are their playmates, wind and weather they fight,
Kids learning by doing, and doing all right!

Helmeted centaurs outrunning sound,
Celestial cavalry scorning the ground,
Learning their lessons, discovering when,
In shaming the eagles, boys become men!

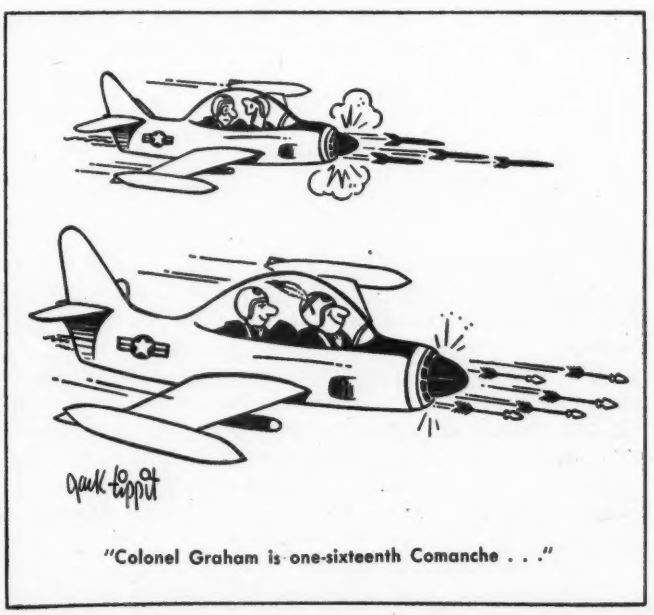
BY T. VINCENT MCINTIRE

☆

An indication of why the Cordiner Committee did such a good job was given at a press conference in which Mr. Cordiner impressed newsmen with his candor and willingness to stick out his neck. Mr. Cordiner predicted, without equivocation, that adoption of the plan could eventually save the taxpayer as much as $5 billion annually, or increase military capability fifteen percent at present spending levels, or whatever combination of the two the powers-that-be should decide was desirable.

☆

And speaking of Mr. Cordiner, this is a reminder that Saturday, May 18, is Armed Forces Day. "Open House" will be held at most military installations during the preceding week. AFA once again co-sponsors the big Armed Forces Day Dinner at Washington, D. C.'s Sheraton-Park Hotel, with the Navy League and the Military Order of the World Wars—and Mr. Cordiner will be the principal speaker.—END



"Colonel Graham is one-sixteenth Comanche . . ."

Editorials

★ Hitting the AF Below the Belt

A particularly vicious and unwarranted attack on the integrity of Air Force leaders, apropos the revised intelligence estimates of Soviet heavy-bomber production appeared in the March 9 edition of the *Arizona Daily Star,* (Tucson, Ariz.), in a long editorial entitled "A 900-Million-Dollar Bobble." The paper's editor, William R. Mathews, who at one time was special advisor to the late Defense Secretary James V. Forrestal and a man who therefore should know better, went out of his way to undermine his readers' confidence in the men who shape our airpower policies.

The editorial quoted at length from the March 8 issue of *US News and World Report,* which originated the "900-million-dollar-bobble" expression. The *US News* article, as quoted, said, in part:

"Just a year ago, a secret intelligence report was given to a committee of Congress (the Symington airpower subcommittee) concerning Russia's strength in long-range airpower. The Russians, according to 'leaked' reports, were said to have more than 100 Bison heavy bombers, far surpassing the numbers the US had of its comparable jet bomber, the B-52.

"A furor ensued in Congress, and in the press. Congress grew concerned over an apparent Russian lead in a vital defense field. As a direct result of that concern, nearly a billion dollars was added to the requested Air Force budget, with the understanding that most of it would be spent to speed the output of B-52 bombers.

"Now, however, top defense officials are disclosing to Congress that the intelligence estimate of a year ago has been far too high. Instead of more than 100 super-bombers, the indications seem to be that Russia had only about fifty, with US strength in heavy bombers out ahead."

From this article, the editor of the *Arizona Daily Star* went on to attack the integrity of Air Force leadership, as well as the intelligence of Senator Symington and his colleagues on the subcommittee.

"These words," said the *Star,* referring to the *US News* article, "tell a self-evident story of inexcusably mistaken estimates made by top officers of the Air Force of their own intelligence, and shocking gullibility of Senator Symington and his Congressional colleagues.

"The probabilities are," the *Star* continued, "that the so-called intelligence originated in the minds of some 'armaments spenders' who, on the advice of their well-paid public relations advisors in New York, deliberately planted this misinformation on the Air Force officials and Senator Symington as a way of frightening the American people and members of Congress into spending this extra $900 million."

The anonymous "armaments spenders" and "public relations advisors" are, of course, a threadbare device. But, in the interest of accuracy, we would like to document where the intelligence estimates actually originated. Herewith is a letter received by Senator Symington from Allen Dulles, Director of the Central Intelligence Agency, as published in the *Congressional Record* of April 4:

"Dear Senator Symington:

"Yesterday, in your telephone call, you asked me for a memorandum with respect to the change in the National Intelligence Estimate on Soviet heavy-bomber strength which differed from that given in the testimony before your subcommittee last April. You also called my attention to certain newspaper publicity which appeared recently with respect to this matter.

"The facts are as follows:

"The intelligence community is continually reviewing its current and projected estimates of Soviet strengths against the best evidence obtainable. Production difficulties, modifications of design, change in emphasis, and other factors, mean that actual production here, in the USSR and, in fact, anywhere, does not necessarily coincide with predictions.

"The estimate of Soviet heavy-bomber strength as of April 1, 1956, which was given in my testimony before your subcommittee, was based largely on an estimated build-up rate which rested upon earlier evidence.

"Subsequent to my testimony before your subcommittee in April 1956, the intelligence community acquired new and better evidence on Soviet heavy-bomber production and strength in operational units, and we undertook a complete review of our estimates on this subject. Our revised estimate was not completed until after the conclusion of hearings before your subcommittee and after the adjournment of the Congress. It was based on new evidence and not on any extraneous considerations. This new agreed National Estimate revised downward the estimated total production of Bisons as of July 1, 1956, but did not change the estimated number of modern bombers which the USSR could and, in the opinion of competent experts, probably would provide in its long-range force in the time period beyond the next two years, as submitted to your subcommittee in April. Obviously, this estimate of future Soviet heavy-bomber strength will be subject to constant review in the light of new intelligence.

"As you will recall, an insert for your subcommittee's record of my testimony, including the revised Bison estimate of July 1, 1956, was delivered to the Staff Director of your subcommittee on November 5, 1956.

"As Director of the Central Intelligence Agency, my responsibility with respect to National Intelligence Estimates is set forth in Section 102 (d) (3) of the National Security Act of 1947, which provides that,

"(d) For the purpose of coordinating the intelligence activities of the several government departments and agencies in the interest of national security, it shall be the duty of the Agency, under the direction of the National Security Council . . .

"(3) to correlate and evaluate intelligence relating to the national security, and provide for the appropriate dissemination of such intelligence within the government, etc., etc.

"In exercising this responsibility, I am assisted by those members of the intelligence community who have competence in the particular field involved."

ALLEN W. DULLES
Director
Central Intelligence Agency

Mr. Dulles's comments bear out our editorial of last month, when we pointed out that national intelligence estimates are revised periodically, as new information becomes known. He also backs up our contention that the current US lead in modern long-range bombers is estimated to apply only over the next two years and that beyond that point there had been no change in the earlier estimates of Russian superiority in this field.

Unfortunately, a sort of Gresham's law applies in the field of communication of ideas as well as in that of money, and wrong information tends to drive the truth out of circulation. The Lord only knows how many readers of the *Arizona Daily Star* were convinced by the raucous ravings of its editor. But even if only one good citizen of Tucson has been misled by the *Star's* misinformation, that is one too many.

★ Is Nickerson a Modern Billy Mitchell?

On May 15, in Huntsville, Ala., home of the Army's Redstone Arsenal, Col. John C. Nickerson, Jr., US Army Ordnance Corps, is scheduled to stand trial before a general court-martial. He will be tried on two separate charges –violation of Articles 92 and 134 of the Uniform Code of Military Justice. The first has to do with the preparation and transmittal to unauthorized persons of a document, "Considerations on the Wilson Memorandum," which according to the specifications that support the charge, contained "secret defense information, the unauthorized disclosure of which could result in serious damage to the United States." The second charge is basically one of perjury, in that it is alleged that Colonel Nickerson made false statements under oath as to transmittal of classified information to unauthorized persons.

Thus far the Nickerson case has generated far more heat than light. In some quarters he is being built up as a modern-day Billy Mitchell, willing to lay his military career on the block to prove his point. Another school of thought sees the Nickerson case as part of the Army's "Revolt of the Colonels," similar to the Navy's "Revolt of the Admirals" some years ago.

High-powered legal talent has been engaged to defend Colonel Nickerson, including Ray Jenkins of Knoxville, Tenn., of the Army-McCarthy hearings fame, and Robert Bell of Huntsville, noted in his home state as an orator. Almost 200 reporters have indicated they will cover the trial, and the networks have asked permission to televise and broadcast from the courtroom.

As a result, the actual charges and specifications on which the colonel is to be tried may well be lost in a welter of emotion. The emphasis is likely to be placed on why he did what it is said he did, rather than whether or not he did it. This is why we choose this moment to place some elements of the case in perspective.

First of all, there undoubtedly will be an attempt to place the Secretary of Defense figuratively on trial. For it was Secretary Wilson's famous memorandum of last year which gave the Air Force operational responsibility for all ballistic missles of more than 200 miles' range, including the Army's Jupiter under development at Redstone Arsenal. Colonel Nickerson was coordinator of the Jupiter project and is said to have taken the alleged actions in order that public opinion might force Mr. Wilson to reconsider.

It is at this point that the comparison with both the Billy Mitchell case and the "Revolt of the Admirals" ceases to be valid.

Billy Mitchell, in developing his case for airpower, revolted against military authority in order to call public attention to a new and powerful weapon that was being neglected by both military services—Mitchell's own as well as the Navy. Mitchell was fighting for an unaccepted weapon. He thought the nation needed airpower, and it appeared to him that it could not be obtained except through a drastic reorganization of the military set-up.

The "Revolt of the Admirals," on the other hand, was a revolt against a new weapon—the long-range, atom-bomb-carrying bomber—which threatened the future of a more traditional weapon, i.e. carrier-based airpower. It was, in essence, an attempt to compete for a mission with the point of the argument being which of the two different weapons the country should spend its money on to accomplish a single mission.

The Nickerson case, or the so-called "Revolt of the Colonels," is another breed of cat altogether. The validity of the weapon is not in question. There is unanimity among the services that our ballistic missile program should be pushed. Rather the question is one of control: which service should be the ultimate user of the weapon, not who should develop it or whether it should be developed at all.

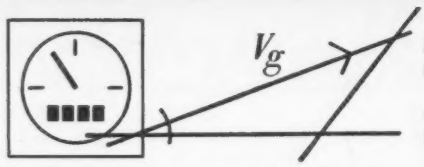
The Air Force has long been working on the intermediate-range missile, Thor. The Army is continuing work on Jupiter, until June 30, at least. Hence, the Army's loss of operational responsibility for IRBMs does not mean that the nation will be without an intermediate-range ballistic missile program. Therefore, it is difficult to escape the conclusion that Colonel Nickerson is not a great partisan of a new and revolutionary weapon, fighting to rectify a national sin of omission, as was Mitchell. Instead, he apparently is an outright Army partisan—however sincere, honest in his belief, or patriotic in his motives.

To summarize, Billy Mitchell revolted to *give* the nation a new and powerful weapon. The admirals revolted in an attempt to *keep from* the nation a new and powerful weapon because it was not to be employed by the Navy. Colonel Nickerson revolted primarily to *insure* that the Army would have a share in using a new and powerful weapon.

So Colonel Nickerson is no Billy Mitchell. Yet an effort is being made to make him so—and that effort might well succeed.

The American public is notably sympathetic to martyrs —and in Nickerson, the Army colonels have an articulate one. But the public likewise is sick to death of interservice wrangling. Billy Mitchell's revolt was ultimately successful in its appeal to public sentiment. Whether that of John Nickerson will succeed remains to be seen.

(Editorials continued on page 45)



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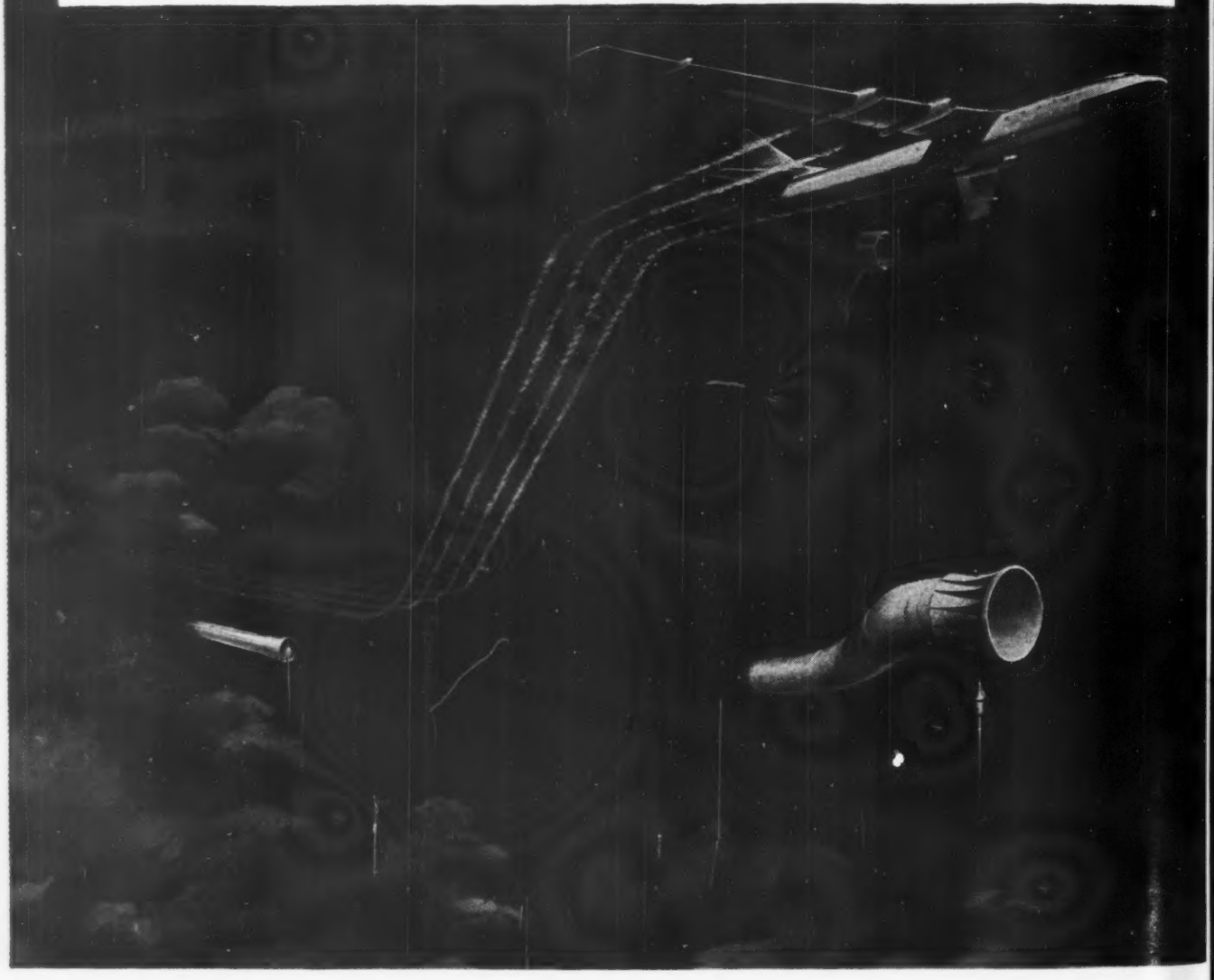

"oops! headwinds"

Spotting a headwind is easier than reading a windsock for military pilots these days.

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★ Of Nails and Horseshoes

Fortunately, the United States has never had to learn lessons from a war which it has lost. This is no reason, however, why we should not profit from the mistakes of our defeated enemies. A case in point, one which should cause the Congress to take a long look at the lean Air Force research and development budget for FY 1958, can be found in a book called *Midway: The Battle That Doomed Japan*. The co-authors are two former Japanese naval officers, Capt. Mitsuo Fuchida and Cmdr. Masatake Okumiya. The pertinent quotation is as follows:

"In technological achievement, too, Japan started out the Pacific War in an inferior position and remained there. The clearest and most serious example of this deficiency was our lack of radar. Two days before the sortie for Midway, radar installations were made in battleships *Ise* and *Hyuga*, the first Japanese warships to be so equipped. Months earlier, naval authorities had been urging that radar sets be provided for our carriers, but development in this field of electronics lagged so pitifully that the two sets available at the last minute were only experimental models, and even these were not to be had for the carriers. Had we been six months farther along in our radar development it would have been an invaluable asset in this decisive battle. Radar could have pierced the fog that hampered the *Nagumo* force's outward passage and approach to the battle area. What is more important, it could have detected and located enemy scout planes in time for our fighters to destroy them before the enemy fleet could be informed of our position; it could have given earlier warning of planes which attacked our carriers, and—installed in our reconnaissance planes—it could have detected the enemy task forces far sooner than was done by visual sighting.

"This speculation brings to mind an ironic circumstance concerning radar development in World War II. One vital component of radar is the directional antenna. Early success in perfecting such an antenna was achieved by a Japanese college professor, Dr. Hidetsugu Yagi, who made public his discovery in Japan in 1932 and soon thereafter visited the United States, where his findings were honored by publication in several scientific journals. It was a matter of but fleeting pride to Japanese forces invading Shanghai to find electronic installations there employing the 'Yagi antenna.' England and the United States had availed themselves of this invention and developed it to their use while Japan had neglected to do so."

Had the Japanese government had the foresight, back in 1932, to follow up on the development of the Yagi antenna, it would not necessarily have meant she would have won the war. But the fact is that lack of radar foredoomed the Japanese Navy to defeat at Midway and made ultimate victory for the United States inevitable.

Now look at this year's AF research and development budget. It calls for $661 million, a reduction of $50 million from last year and a whopping $139 million under the $800 million that Secretary Quarles has said the Air Force needs. Without getting into the bookkeeping ramifications which make true R&D figures hard to track down, it is fair to say that R&D funds have remained quite stable over the past half-dozen years.

Anyone who has been living on a fixed income during these same years knows what this means. Inflation alone, according to Dr. Clifford C. Furnas, recently resigned Assistant Secretary of Defense for R&D, has cut the purchasing power of the R&D dollar by forty-three percent. And when one looks at what the Air Force R&D budget is designed to pay for, he can see that the amount available for honest-to-Pete research has dwindled almost to the vanishing point.

Here's why. To see how much real research we are buying for the Air Force, let's divide the R&D program into three categories of expenses.

First, there are fixed annually recurring obligations, including such overhead as permanent staffs and installations plus several large contracts, such as that with the RAND Corporation, funded annually at a gradually increasing rate. This portion alone takes an increasing slice out of R&D funds as inflation whittles away.

Next are the high-priority weapon systems now under development, which have been ordered to be pushed with highest priority. Examples are the ballistic missile family and the SAGE air defense program. Inflation and higher development costs as work progresses both take their toll in this area.

The third category—speculative research to advance the state of the art—must be paid for out of what is left.

Thus, if the amount of money remains relatively the same year after year, and the first two categories take bigger and bigger bites from the R&D pie, the money left for speculative research shrinks into nothingness.

This presents a fertile field for Congressional inquiry as the budget hearings progress. The list of programs either canceled, or withering on the vine, is legion. And, even worse, there will be little new blood pumped into the research program as time goes on.

We wonder who, should we lose a war or fail to deter one because our technology was not exploited, will wish to confess to his conscience that he failed to act at a time when action would have helped. We wonder if the man who said "no" to the Japanese radar expert was at Hiroshima or Nagasaki.

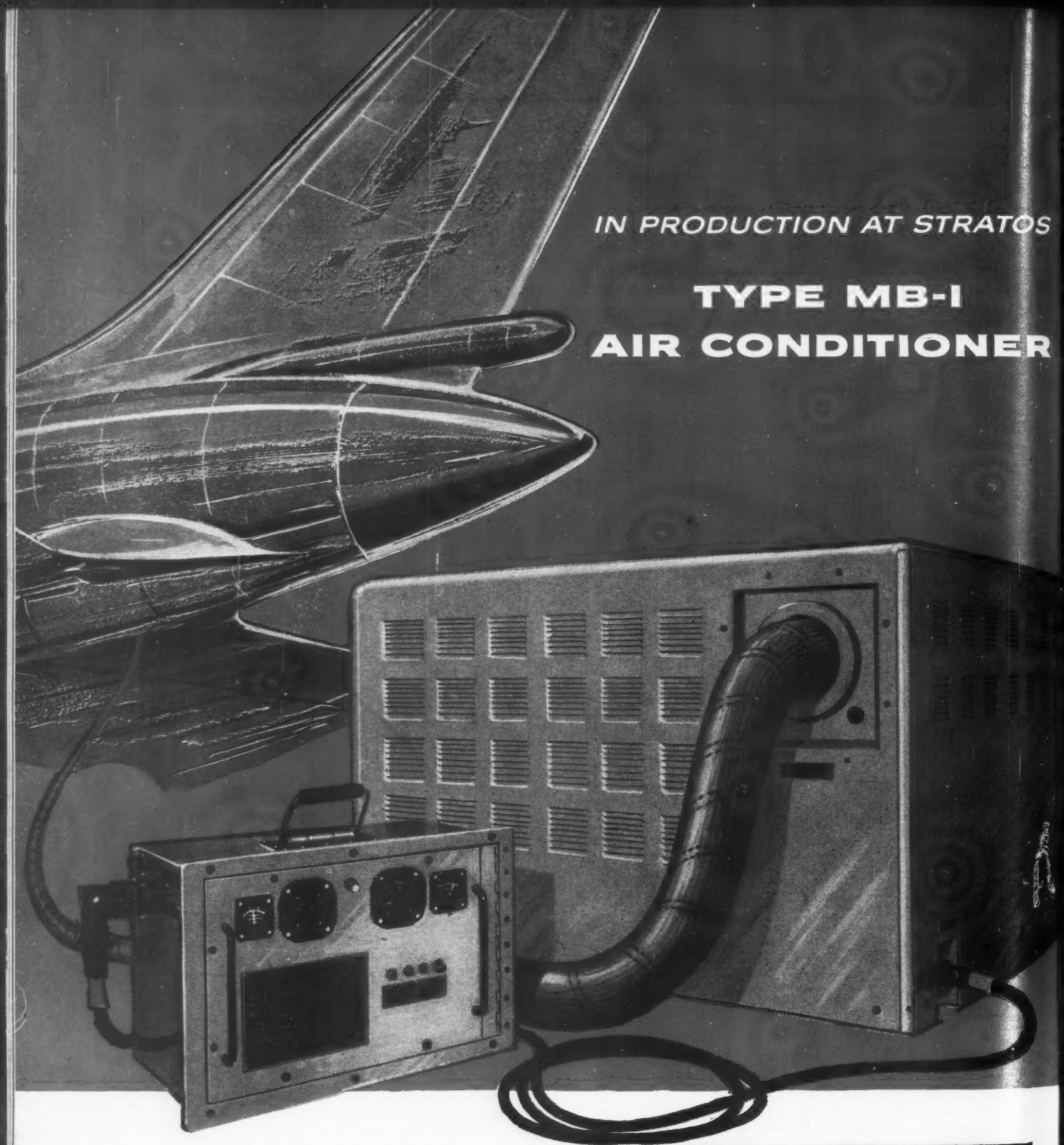
★ Use of Nuclear Arms

"The argument that the use of nuclear weapons in small wars will automatically bring about global conflict is one that I have never been able to understand.

"If there are powers who want to enlarge the local battle, they will do so regardless of what weapons we shall be using. If anything, our successful employment of such weapons might serve as an additional deterrent. If such powers do not want to expand the area of conflict, they will not willfully do so—again, regardless of the weapons we might use. After all, there is no weapon that is not cruel and destructive. It is not the type of weapon that makes the difference. It is the manner in which the weapon is employed.

"Finally, the aggressor will know that we are prepared to use our best weapons although we will use our force selectively and with discrimination. In my opinion, immediate and decisive action in local situations is essential to keeping these conflicts from spreading. It is this over-all capability that we must maintain in our defensive structure."

From a speech by Gen. Nathan F. Twining, USAF Chief of Staff, before the Council on World Affairs, Inc., Indianapolis, Ind., March 22, 1957.



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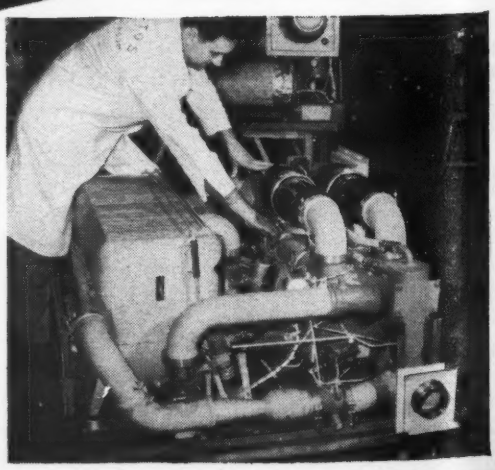
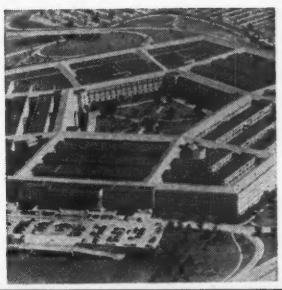


Stratos' Model GEA120-1 air conditioning system being prepared for production test.

AIR FORCE
MAY 1957

STRATEGY AND ORGANIZATION FOR THE NUCLEAR AGE

A unified strategic doctrine combined with a realistic reorganization of defense forces are nuclear necessities



By Henry A. Kissinger

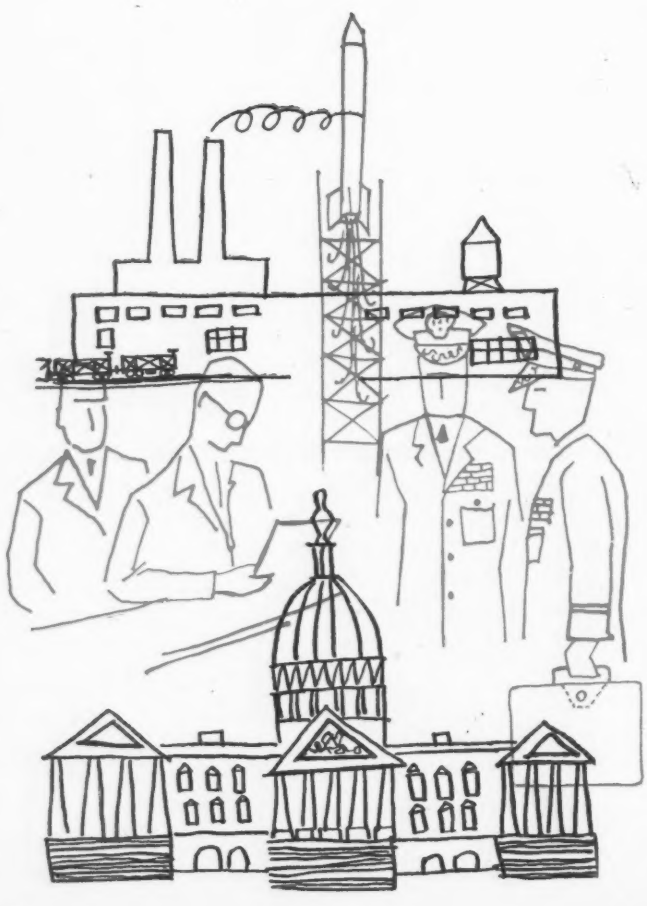
WHATEVER the problem—whether it concerns our military strategy, our system of alliances, or our relations with the Soviet bloc—the nuclear age demands above all a clarification of doctrine. At a moment when technology has put within our grasp a command of nature never before imagined, we are driven to realize that everything depends on our ability to use power with subtlety and discrimination. In the absence of concepts that define the nature of power, its purpose, and its relation to policy, the possession of it may serve merely to paralyze the will. All the difficult choices of the nuclear period—the nature of its weapon systems, the risks diplomacy can run, the issues for which to contend—presuppose a doctrinal answer before they can find a technical one.

This is particularly true of military strategy. Because we have won two world wars by out-producing our opponent, we have tended to equate military superiority with superiority in resources and technology. Yet history demonstrates that superiority in strategic doctrine has at least as often been the cause of victory as has superiority in resources. Superior doctrine enabled the Germans in 1940 to defeat an Allied army superior in numbers and at least equal in equipment but wedded to an outmoded concept of warfare. Superior mobility and the use of artillery, a better relationship between fire and movement, furnished the basis of Napoleon's victories. Similar examples were the victories of the Roman legions over the Macedonian phalanx, of the English archers against the medieval knights.

All these were victories not of resources but of strategic doctrine: the ability to break the framework which had come to be taken for granted and to present the antagonist with contingencies which he had never even considered before.

Strategic doctrine translates power into policy. Whether the goals of a state are offensive or defensive, whether it seeks to achieve or prevent a change, its strategic doctrine must be able to define what objectives are worth contending for and to develop the appropriate force for achieving them. By establishing a pattern of response *in advance* of crisis situations, strategic doctrine permits a power to act purposefully in the face of challenges. In its absence a power will constantly be surprised by events. An adequate strategic doctrine is therefore the basic requirement of American security.

BATTLE OF THE BUREAUCRACY



It may be argued, of course, that we do possess a strategic doctrine expressed in the decisions of the Joint Chiefs of Staff and of the National Security Council on the basis of which the force levels of our armed forces are determined by Congress. But the decisions of the Joint Chiefs and of the National Security Council give a misleading impression of unity of purpose. The officials comprising these bodies are either service chiefs in the case of the Joint Chiefs of Staff or heads of executive departments in the case of National Security Council. As administrators of complicated organizations, they must give most of their attention to reducing the friction of the administrative machine both within their department and in the relation of their department to other agencies. The heads of departments do not stand above the battle of the bureaucracy; they are spokesmen for it. In fact, the departmental viewpoint is sometimes purposely exaggerated in order to facilitate compromise.

As a result, the conclusions of both the Joint Chiefs of Staff and the National Security Council reflect more the attainable consensus among sovereign departments than a sense of direction. Because agreement is frequently unattainable except by framing conclusions in very general language, decisions by the Joint Chiefs of Staff or the National Security Council do not end interdepartmental disputes. Instead they shift them to an interpretation of the meaning of directives. And departments or services whose disagreements prevented the development of doctrine in the first place will choose the exegesis closest to their original point of view. The seemingly unanimity of our policy-making bodies only defers the doctrinal dilemma until some crisis or the budgetary process forces a reconsideration under the pressure of events.

Within the Department of Defense these problems are compounded by the obsolescent division of functions among the services and the predominant role played by fiscal considerations in setting force levels. The Key West Agreement of 1948 confirmed the traditional division: each service was to continue with its primary mission of defeating its enemy counterpart; the mission of the Air Force is to dominate the sky, of the Navy to control the sea, and of the Army to defeat the enemy's ground forces.

But with modern weapons, the traditional definition of primary missions amounts to giving each service a claim to develop a capability for total war. For the sky cannot be dominated short of a scale of attack on the opposing retaliatory force which will unleash an all-out conflict: control of the seas implies the destruction of industrial facilities and supply depots deep in enemy territory, as Adm. Arleigh Burke, Chief of Naval Operations, testified before the Symington Subcommittee; and the Army has declared that a 1,500-mile missile is essential for the performance of its mission. A division of functions among the services makes sense only if the functions in fact represent distinguishable strategic missions. If each service in the performance of its primary mission must carry out tasks inseparable from the primary mission of a sister service, energies will be increasingly absorbed in jurisdictional disputes. Nor can this problem be avoided by administrative fiat as has been repeatedly attempted. The interservice rivalries are inherent in the definition of missions; they result inevitably from a division of roles on the basis of means of locomotion in the face of a technology which makes a mockery of such distinctions.

As a consequence of the lack of doctrinal agreement, none of the services can be certain that a sister service's interpretation of what constitutes an essential target accords with its own. It is therefore convinced that it cannot relinquish control over any weapon which it believes important to the achievement of its mission. The only way a service can be certain that its targets will in fact be attacked is to seek to obtain every weapon that can be used against them, even if such a weapon already exists in a sister service.

"If I was assured when we wanted to attack Russia on a strategic mission," said Air Force Gen. Nathan F. Twining during the Symington hearings on American airpower, "that the naval carriers were assigned to General LeMay, . . . fine. But that is not the case, and I don't know where those carriers are going to be . . . so the Strategic Air Command has to be just as big, just as strong, and just as ready, regardless of this Navy contribution."

"The primary function of the Air Force," said the Army's Chief of Staff, Gen. Maxwell D. Taylor, defending the Army's development of a 1,500-mile missile, "is to destroy enemy airpower and for the Navy to destroy enemy naval power. . . . If you accept the fact that the Army exists to destroy hostile armies, then any missiles which will destroy hostile ground forces should be available to the Army."

The rigid division of functions, therefore, exacerbates disputes among the services. Since no service can achieve its primary mission without defeating the enemy completely, each service will always consider its force levels inadequate and will be convinced that one reason for this inadequacy is a transgression by a sister service on its field of jurisdiction. Moreover, while the present assignment of roles produces a duplication of some categories of weapons, it causes some others to fall between two stools. The disputes between the Army and the Air Force regarding the importance of airlift provide an illustration. The Air Force, charged with defeating the enemy air arm, must look on an investment in planes having no strategic or tactical combat effectiveness as a diversion of resources. The Army, on the other hand, cannot carry out its mission

(Continued on following page)

OUTSTANDING INTERPRETER OF MILITARY FORCE

Military force, if it is to play its proper role in support of meaningful national policy, must be understood by the diplomats as well as the generals. During the first century and a half of our republic's existence, military force was a relatively unsophisticated, easy-to-understand element of national strength.

Even the astounding growth of American airpower during World War II quite probably would not have altered appreciably the conventional approach to diplomacy had not it been coupled, at war's end, with the almost infinite power of the splitting atom.

The force unleashed from the atom's heart was too stupendous to be ignored. Aerial delivery, first atomic, later of hydrogen bombs, at supersonic speeds, became the supreme expression of military might. Airpower became, almost overnight, even more powerful as an arbiter of the world's destinies than the supposedly exaggerated claims of its pre-Hiroshima prophets. Some diplomats, and even a few generals, tried to ignore this new force. Happily, the majority of the diplomatic community has addressed itself to the arduous task of understanding airpower's capabilities and keeping up with its explosive advances of the past dozen years.

Henry A. Kissinger is a young scholar who devotes a good part of his considerable talent to interpreting military force to the diplomats. Although his military background is Army, he has developed a rare understanding of both airpower's capabilities and its limitations. His writings on the subject, of which this article is the most recent, constitute a major contribution to a better appreciation of the role of airpower in the modern world.

Mr. Kissinger is Director of Special Studies, Rockefeller Brothers' Fund; Associate, Foreign Policy Institute, University of Pennsylvania; and Director, Harvard International Seminar. This article is reprinted with permission from the April 1957 issue of "Foreign Affairs," a quarterly published by the Council of Foreign Relations, Inc. It is adapted from a study, prepared for the Council, which will be published in June by Harper & Brothers under the title "Nuclear Weapons and Foreign Policy."—THE EDITORS.

if it is not able to get into position rapidly. The present division of functions, therefore, produces either duplication or an inability to consider requirements in terms of overall strategy.

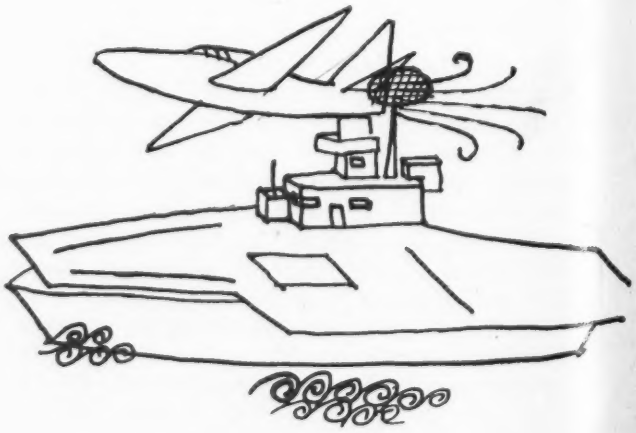
Another factor which inhibits the development of strategic doctrine is the predominance of fiscal considerations in our defense planning. This is not even always a question of deliberate choice. One of the reasons for the emphasis on fiscal policy and technology has been that the former has been explicit and the latter impressively demanding. In the process of coordinating diverse policies, which is the primary function of the National Security Council, there always exists a clear fiscal policy, largely because governmental economy is the *raison d'être* of the Bureau of the Budget and because only one agency—the Treasury Department—is responsible for setting objectives in the fiscal field. But there is rarely, if ever, a clear National Security policy to oppose it. On the contrary, the contending services have been tempted to enlist the backing of the Treasury Department and the Bureau of the Budget by advocating their particular strategy as contributing to governmental economy. The fiscal viewpoint, therefore, often comes to predominate by default; in a conceptual vacuum the side with the clearest and most consistent position will gain ascendancy.

Whatever the reason, every administration since World War II has at some time held the view that this country could not afford more than a certain sum for military appropriations, overriding the question of whether we could afford to be without an adequate military establishment. Now the imposition of a budgetary ceiling is not inevitably pernicious; a removal of all budgetary restrictions would inhibit doctrine even more, because it would lead each service to hoard weapons for every eventuality —as occurred to some extent during the Korean war. And the proliferation of weapon systems unrelated to doctrine will cause strategic decisions—which always involve choices—to be made in the confusion of battle. The difficulty with our present budgetary process is that by giving priority to cost over requirement it subordinates doctrine to technology. Budgetary requests are not formulated in the light of strategic doctrine; rather doctrine is tailored and, if necessary, it is invented to fit budgetary requests.

The predominance of fiscal considerations makes for doctrinal rigidity because it causes each service to be afraid that a change in doctrine will lead to a cut in appropriations. This is illustrated by a violent dispute in 1950 between advocates of strategic airpower and a group of scientists at the Lincoln Laboratory of the Massachusetts Institute of Technology, who were accused of advocating a cut in our retaliatory force in order to build up air defense. The remarkable thing about this dispute was that the MIT group explicitly denied underrating the importance of strategic airpower; they insisted that their recommendations had been solely concerned with building up our air defense. Yet the partisans of strategic airpower had psychology, if not logic, on their side. With a fixed ceiling on defense expenditures, it was clear that any new appropriation was bound to lead to the reduction of existing forces; a new capability could in practice be developed only at the expense of one of those already in existence.

As a result, budgetary pressures compound the inherent conservatism of the military and end in subordinating doctrine to the battle for appropriations. Each service pushes weapons development in every category without sufficient regard for the program of other services, and each service seeks to obtain control over as many different weapons as possible as a form of insurance against drastic budgetary cuts in the future. The predominance of fiscal considerations in our defense planning actually encourages a subtle form of waste: in the absence of an agreed strategic doctrine, it leads to the proliferation of partially overlapping, partially inconsistent weapon systems. Because to relinquish a weapon system may mean to relinquish the appropriations that go with it, every service has a powerful incentive to hold on to every weapon even after it has outlived its usefulness.

The doctrinal handicap imposed by the predominance of fiscal considerations is not compensated for by an increase in civilian control either within the Executive Branch or by Congress. The difficulty of effective control over military programs is due to two factors: the fiction of the yearly review of programs and their technical complexity. The yearly review is increasingly inconsistent with the realities of defense planning. The hiatus between development and procurement is several years in the case of most weapons; the introduction of a new weapon into a unit implies that all units will be so equipped over a period of time. Thus the first order for B-52s logically carried with it the obligation to continue procurement until all heavy-bomber wings of the Strategic Air Command were composed of jet planes. Similarly, the beginning of construction of an aircraft carrier makes almost inescapable future appropriations to complete its construction.



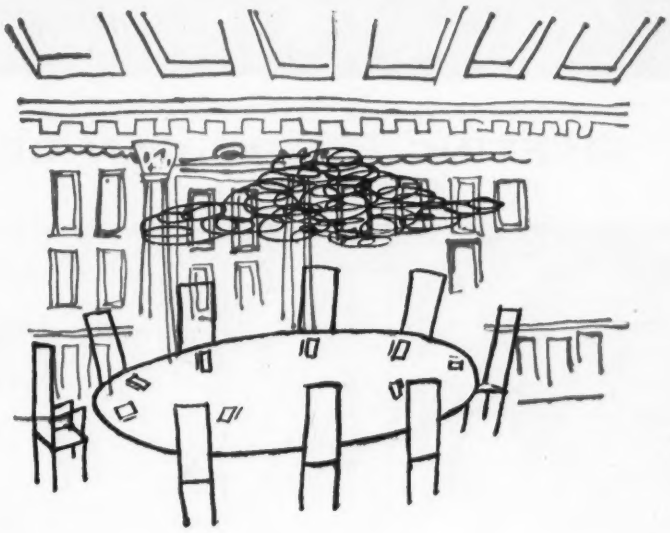
In these circumstances, a yearly review does not bring about effective control; it does ensure, however, that no dispute is ever finally resolved. Each year the same arguments about the efficacy of limited war, airlift, and the relative merits of carrier and strategic aviation are repeated. And they are not settled until some technical development outstrips the dispute or an administrative decision allocates roles and missions which the losing service accepts only because it has every prospect of reopening the issue in the following year. In the absence of doctrinal agreement, interservice disputes can be resolved only by compromises which may define merely the least unacceptable strategy or by adding to the number of missions and weapon systems.

The technical complexity of most disputes complicates civilian control and particularly Congressional control even further. Within the Department of Defense the multiplication of civilian officials, often in office for only a year or two, causes the Secretaries and Assistant Secretaries to become less agents of control than a device to legitimize interservice disputes. Their short term in office makes it difficult if not impossible for them to become familiar with the subtleties of the strategic problems. Instead of being able to establish a unified concept, they become spokesmen for the professional staff on whose advice they are dependent.

As for Congressional control, the only forum where the over-all defense program can be considered is in the Appropriations Committee. A meaningful judgment by the Congress on the defense budget would presuppose an assessment of the military strength achieved by a given expenditure and the relationship of this strength to a set of national security objectives. Neither condition is met by current practice. To be sure, the budget is introduced by testimony of the service chiefs and their civilian superiors regarding the gravity of the international situation. But no attempt is made to show the relationship of strategy to events abroad beyond the general implication that the proposed program would ensure the security of the United States. In turn, the Congressional Committees can make their judgments only in terms of a vague assessment of the international situation; they will be hesitant to reduce the budget if they feel the situation too grave, and they will be disposed to pare requests drastically when they think the situation is not as serious as represented to be.

Such consideration of strategic concepts as does take place on the part of Congress is usually produced by the dissatisfaction of some service with its budgetary allocations. Thus the B-36 hearing in 1949 resulted from the cancellation by Defense Secretary Louis Johnson of the Navy's giant carrier, and the Symington Subcommittee hearings on airpower were the consequence of the budgetary ceiling imposed on the Air Force (and other services too) by Secretary Wilson. This procedure has the disadvantage of emphasizing the problems of one particular service and of obscuring the real difficulties which occur in the area of overlapping strategies.

Moreover, even the hearings explicitly addressed to the problems of the roles and missions of the services tend to be conducted in the familiar technical categories. Thus during the Symington hearings on American airpower in 1956, relatively little attention was paid to the strategic concepts of the services; on the whole, the subcommittee was content to take the services at their own valuations. But a great deal of time was spent on the relative numbers of the Soviet and United States heavy-bomber forces and the relative thrust of jet engines. These figures are important, to be sure, but their meaning derives from strategic doctrine. Without a concept of war—or at least of air war—comparative numbers mean little, and the relative thrust of jet engines means less. The quest for numbers is a symptom of the abdication of doctrine.



In order to create a favorable climate for their budgetary requests, the services tend to emphasize the most ominous aspects of the United States security problem. Because of their awareness that there exists a greater receptiveness for programs which seem to offer total solutions, each service is encouraged to stress the part of its mission which poses the most absolute sanctions. Thus in 1951 the Army produced the "atomic cannon," a cumbersome, hybrid, and already obsolescent weapon, in part to obtain access to the nuclear stockpile.

Similarly, after the B-36 hearings, the Navy ceased the identification of deterrence with maximum retaliatory power; in fact, it adopted the theory as its own and in its budgetary presentations, at least, it has emphasized its contribution to the strategic striking force more than its less dramatic task of anti-submarine warfare. And Congressional hearings leave little doubt that even within the Air Force, the Strategic Air Command has the most prestige value.

Thus the budgetary process places a premium on the weapon systems which fit best with the traditional preconceptions of American strategic thought. It is not that the belief in the importance of strategic striking forces is wrong in itself; indeed, the Strategic Air Command must continue to have the first claim on our defense budget. It is simply that the overemphasis on total solutions reinforces the already powerful tendency against supplementing our retaliatory force with subtler military capabilities that address themselves to the likelier dangers and involve a less destructive strategy. A vicious circle is thereby set up; the more terrible we paint Soviet capabilities, the more we confirm our predilection for an all-out strategy. But the more fearful the consequences of our strategy, the more reluctant will the political leadership be to invoke it. In every crisis, we are obliged to gear our measures to the availability of forces instead of having in advance geared our forces to the most likely danger. And even with respect to the forces which we have available, our hesitations are multiplied because the services do not agree among themselves about strategy either for limited or for total war, but particularly for the former.

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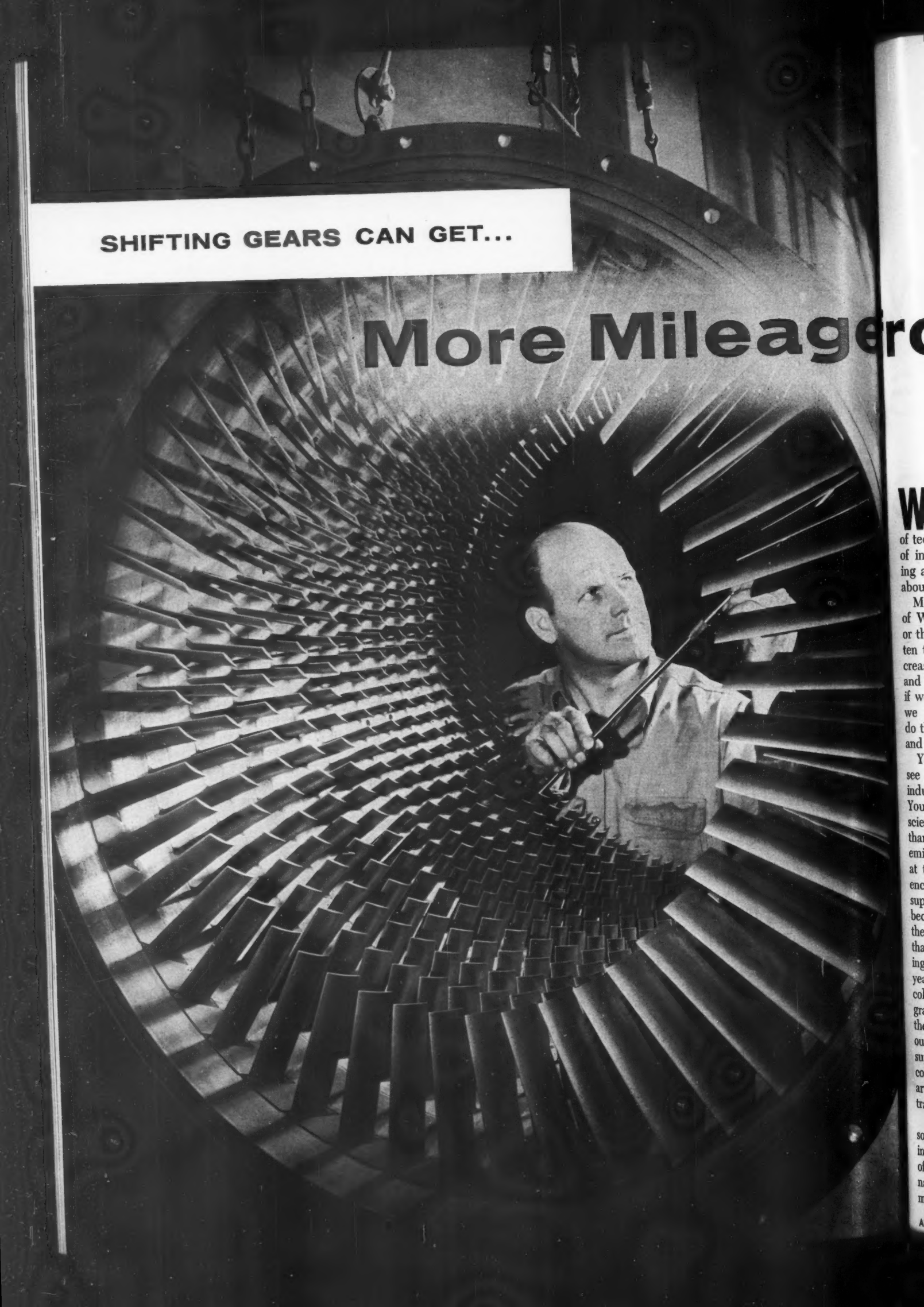
SHIFTING GEARS CAN GET...
More Mileage

By Peter J. Schenk

rom Our Engineers

WE HEAR much about the shortage of scientists, engineers, and technically trained people generally. I would like to . . . examine the apparent shortage of technical personnel—first by looking at the requirements of industry and the military for such people, then looking a bit at the supply, and finally, at what can be done about matching the supply to the demand.

Many of you are familiar with the combat aircraft of World War II. Today's bombers and fighters fly two or three times as fast and as high—and some of them cost ten times as much. The biggest single reason for this increased cost is that they are jam-packed full of electronic and automatic devices—even the manned aircraft. Now if we go a step beyond, and take out the men altogether, we add still more technical complexity. And when we do that, we inevitably add new requirements for engineers and technicians.

You have heard about the shortage of engineers. You see the newspaper display ads, day after day, in which industry bugles its need for technical people of all kinds. You have heard . . . that the Soviet Union is turning out science and engineering graduates at a much faster rate than we are graduating them from our colleges. Such eminent authorities as Edward Teller of H-bomb fame, at the Air Force Association's National Jet Age Conference in Washington in February, stated flatly that scientific superiority will inexorably pass to Russia within ten years, because of our deficient output of scientists, now and in the recent past. It has been pointed out that there is little that, as a nation, we can do quickly to rectify this alarming situation. The low birth rate during the depression years currently gives us an abnormally low supply of college-age men and women. The often inadequate program of science teaching in the secondary schools, and the apparent lack of interest on the part of so many of our high school students in science subjects, limits the supply of qualified candidates for engineering courses in college, and even those who are qualified by the secondary school system to profit from college level scientific training too often do not pursue it in college.

While these serious problems may be beyond complete solution, in the face of ever-increasing demand by both industry and the military services, there are a number of constructive steps that can be taken—in fact, that our national survival practically demands. We can, and we must take some steps, first, to "stretch" the existing supply, by getting maximum productivity from the technically trained people we do have; and second, to increase the production of such people as quickly as possible.

I would like to outline some of these steps, with these two interim and longer term objectives in mind. Fortunately, some of the steps designed to increase productivity at once will also assist in solving the longer term problem, by increasing the attractiveness of the engineering profession, and therefore, in our democratic free economy, the motivation for young men *and* women to enter scientific and engineering training.

In my opinion, American industry as a whole today is guilty, to varying degrees, of wasting technical manpower, by not using such people at their highest skill level, by not providing them with optimum tools and working conditions, and by not planning wisely the application of the right people to the right jobs at the right time.

Examples can be found of graduate engineers doing "coolie labor" that could easily be done by technicians or clerks of far lower skill levels. Engineering graduates in their first few years in industry are sometimes used in ways which date back to depression days—to take repetitive data on equipment tests; or to do routine computations which could be performed by machines, perhaps even better or more cheaply. Engineers of all experience levels are often seen working in large, noisy, confused rooms referred to in the engineering fraternity as "bull pens," with perhaps one telephone for every three men and one secretary for every eight or ten. For lack of administrative help they must spend a substantial fraction of their time personally hunting up reports at the library; making travel arrangements, hotel reservations, and visit clearances. They are treated "by the numbers" as "engineering bodies"—and they respond by producing work of indifferent caliber, as members of the "slip-stick brigade."

While their starting pay out of college has risen spectacularly, ten years later engineers have started to fall behind many of the other professions—so that the more lucrative and glamorous fields, such as sales and management, each year skim off altogether too large a fraction of good engineers. Sometimes this works, but many a fine engineer has been made into a poor manager or an unconvincing salesman, with a net loss all around. A way must be found for rewarding good engineers who want to stay in pure engineering work, as well as those who be-

(Continued on page 56)

SPERRY ANNOUNCES

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CARL G. HOLSCHUH, *President of Sperry Gyroscope Company.*

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SAMUEL AGABIAN has been appointed Manager of the Air Armament Division. Formerly works manager, Mr. Agabian is an Annapolis graduate and former Marine Corps officer. His work at Sperry has included responsibility for computing gunsights, bombsights, antiaircraft devices, radar and infrared developments.

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MYRON D. LOCKWOOD, manager of the Surface Armament Division, was formerly a systems engineering director. A World War II Lt. Col. of Artillery, and military-technical advisor at M.I.T., Mr. Lockwood has been associated with Sperry projects in underwater torpedo fire controls, guidance computers for missiles, antiaircraft control systems and inertial navigation equipment.

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come managers or salesmen. Many of these conditions, once recognized, are fairly easy to remedy. The first, and biggest problem is to create sufficient enlightenment on the part of management that there is a problem, and that there might be a better way.

In my own recent experience in the General Electric Company I have watched the gratifying results of a determined campaign to stretch the engineering output without a corresponding increase in the staff of graduate engineers. In the one area of technician support, for example, at the start of the campaign, a particular engineering section had a ratio of one technician assisting three engineers. Within a year, the ratio was nearly one to one, and at the end of another year, three technicians for every two engineers. While the output of sales billed per engineer depends on other factors as well, it should be obvious that such steps will contribute, not only to solving the national engineer shortage, but that they will make good business sense as well.

And now, let us look for a moment at the longer term problem. Many of the steps which make sense in stretching the immediate supply of engineers have an additional pay-off in the longer range problem area. The things that make engineers more productive, as a rule, make their work more pleasant and enhance the dignity of their profession. Most men enjoy a degree of privacy at work—not necessarily a private office with a rug on the floor, but a cubicle at least, with a partition of sorts, marking out their private "kingdom." The cost of the extra floor space and brick and mortar is slight compared to the return in employee satisfaction, and therefore the increased productivity and the reduced turnover.

The kinds of things I have been talking about up to now are all fairly simple, obvious, and straightforward, and they are all pretty much designed to make the individual technical worker more effective.

Now there are some other steps that are much more difficult and less well understood, but they, too, promise a handsome pay-off, this time in group effectiveness. These are in the area of organization and planning.

It is an old axiom that organizations don't do work—people do. Therefore, there are some who say that it doesn't much matter how you organize—if you have enough good people, you'll get the job done, and if you don't, you'll fall flat on your face. I don't believe this over-simplification myself. I have seen groups of excellent people, man for man, get all tied up in knots because of a confusing organization in which it was unclear to those who tried to work on a large project, who was supposed to do what to whom, and who was to pay the two bucks. Conversely, a group made up largely of men of average talent can sometimes turn out unexpectedly good work, if a clear, logical organization permits one or two inspired leaders to direct the work effectively, and to use the entire organization as a multiplier for their own superior ability.

Finally, a closely related subject is good planning. I don't know how many of you remember the old parlor game of dominoes which was popular while I was a youngster. One of the best ways I have found to illustrate the difference between the mental processes of planning vs. flying "by the seat of your pants" is to compare the game of chess with the game of dominoes.

A good chess player, of course, has his strategy in mind, and is mentally several moves ahead, evaluating alternatives, considering what his objective is, what his opponent might do to foil it, and so on. A domino player sees that there is a square with three dots, he has a piece with three dots to add on, and he does so. It is an opportunistic game in which you build many blind alleys and never know from one move to the next what you will do, what your opponent will do, and who's ahead.

Good planning, of course, is not easy. We are living in a complicated world which is changing constantly and rapidly. At any given time we have only a partial and faulty picture of what is really happening. But unless we set up goals we don't know if we are really making progress in a useful direction, or just churning around making "effort dust." There is an old German saying, which can be loosely translated, "What you don't have in your head, you have to make up with your feet."

I don't want to belabor this point too much, but I sincerely believe that one of the greatest rat holes down which we can pour engineering manpower is what the British so aptly call the "Brute Force and Bloody Ignorance" approach.

We live in a rich country. We have wonderful equipment in our laboratories. The problems we face are tough, and we want to be sure we're right.

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We embark on a number of "parallel approaches." We make massive use of computers to grind out families of curves. We experiment and we study. We apply the quantitative theory of wisdom that much hard work is bound to lead to useful results.

But don't we know deep down in our hearts that this is not always the case? Would it not be wiser very often to do some hard, clear thinking at the beginning, rather than to jump on your horse and ride off in all directions at once?

This is an area in which we could all do better—industry, the military, the Congress, and the government. Good planning to use our manpower wisely, on the jobs that count, is the cornerstone of an enlightened partnership between industry and the military—a partnership which will keep our nation strong and will also keep our people free.—END

ABOUT THE AUTHOR

Mr. Schenk, who is a member of the Air Force Association's Board of Directors, is presently Manager-Projects in General Electric's Technical Military Planning Operation, in Santa Barbara, Calif., a position he has held since last September. He joined GE in February 1954, when he was named Manager of Marketing Research and Product Planning of the Heavy Military Electronics Equipment Department in Syracuse, N. Y. In June 1955 he was promoted and transferred to Utica, N. Y., as Manager of Marketing at GE's Light Military Electronic Equipment Department. Mr. Schenk is an AF Reserve lieutenant colonel, with a mobilization assignment to the AF Scientific Advisory Board. During his more than twelve years of active duty he served as Executive Officer to Lt. Gen. James H. Doolittle; Assistant Military Director of the Scientific Advisory Board; Executive Officer to the AF Chief Scientist and the DCS/Development; and Deputy for Plans and Vice Commander of the Air Force Cambridge Research Center. Born in Vienna, Austria, Mr. Schenk came to the US when he was twelve. He was graduated from Lafayette College, Easton, Penna., in 1941. Mr. Schenk made this speech at AFA's Northern California Air Education Symposium, on Mar. 2.

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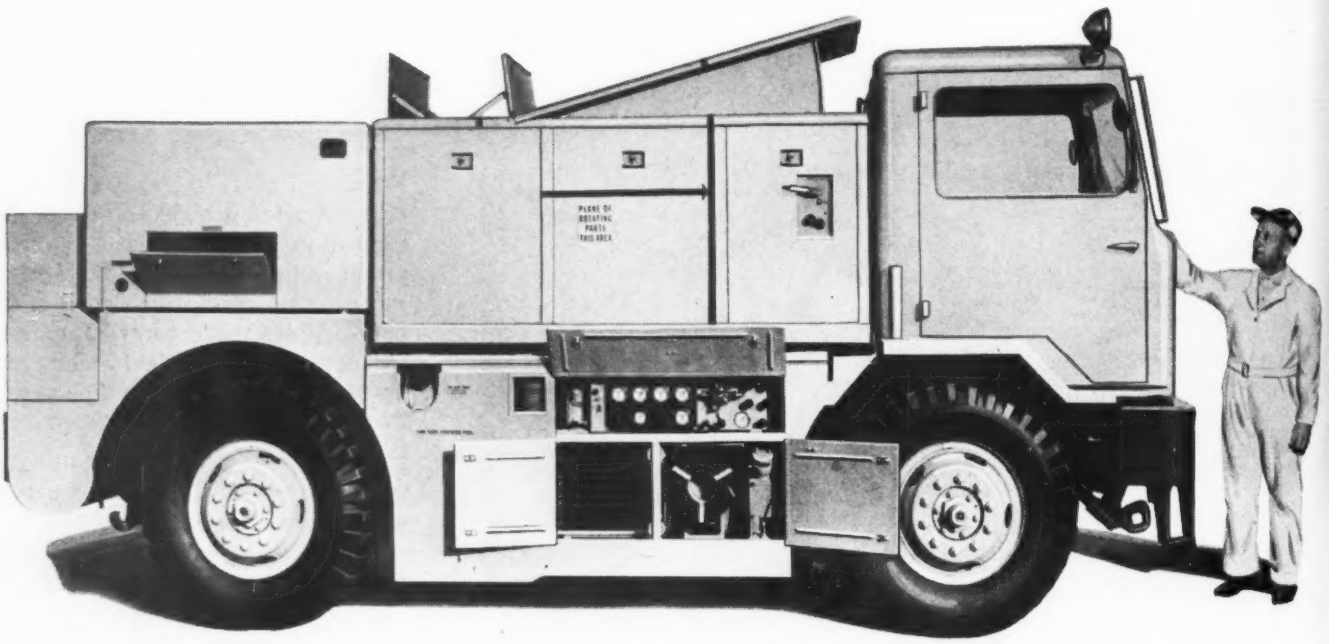

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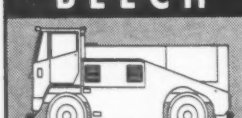
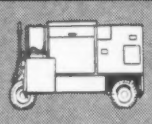
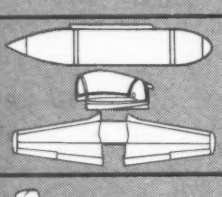
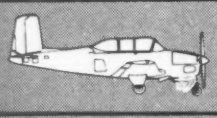
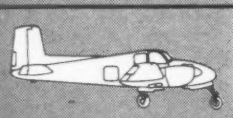
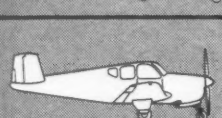
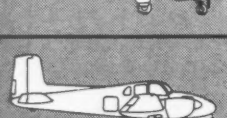
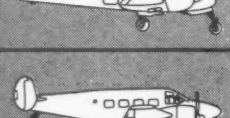
	MA-3 MULTI-PURPOSE VEHICLES
	C-26, MD-3 POWER UNITS
	TANK-WING-MAJOR SUBASSEMBLY SUBCONTRACT PRODUCTION
	BEECHCRAFT T-34 TRAINERS
	BEECHCRAFT L-23 TRANSPORTS
	4-PLACE BEECHCRAFT BONANZA
	6-PLACE BEECHCRAFT TWIN-BONANZA
	8-PLACE BEECHCRAFT SUPER 18

No other ground support unit offers the complete flexibility and "fast starting" action of the Beechcraft MA-3 Multi-Purpose Vehicle, now entering service with the U. S. Air Force.

The MA-3 has 12,500 pounds draw-bar pull for towing aircraft, which can be increased by adding to its gross weight. It has reciprocating and gas turbine power plants, an air cycle type air-conditioner of 13-ton capacity, high pressure air compressor with capacity of 15 CFM of free air at pressures up to 3500 PSI. The vehicle can travel at 45 mph, maneuvers easily, has four-wheel power steering, four-wheel drive and four-speed torque converter transmission (four speeds forward and two reverse).

The MA-3 provides 28 Kilowatts direct current from two self-cooled 500 ampere 28-volt generators; features split and single bus; has three-phase alternating current 60 KVA-45 KW; and a self-cooled alternator, precisely controlled frequency 400 CPS.

Unexcelled in-the-field service by thousands of Beechcraft ground power units and a world-wide service organization add to the advantages of this truly exceptional unit.

Inquiries from airlines, manufacturers, and others who desire details of the most advanced and modern ground support unit will be welcomed by the Contract Administration Division, Beech Aircraft Corporation, Wichita 1, Kansas.

Beechcraft

BEECH AIRCRAFT CORPORATION, WICHITA, KANSAS, U. S. A.

From left: Hon. James H. Douglas, New Secretary of the Air Force; Hon. Donald A. Quarles, new Deputy Secretary of Defense; Gen. Nathan F. Twining, next Chairman of the Joint Chiefs; Gen. Thomas D. White, next AF Chief of Staff.

NEW TOP COMMAND IN THE PENTAGON

IN POINT of time, the Air Force must be considered the junior service of the nation. But last March it learned with pride what it had suspected for some time—that its top man would become top man of the Joint Chiefs of Staff. It was all part of a significant reshuffling of top leaders—military and civilian—within the Pentagon.

As a result of a presidential nomination, AF Chief of Staff Gen. Nathan F. Twining will become next Chairman of the Joint Chiefs—the first Air Force man in history to hold the nation's highest military job. His two-year term starts August 15, when he replaces Adm. Arthur W. Radford, who is eligible for retirement.

General Twining's present Vice Commander, Gen. Thomas D. White, will become Air Force Chief of Staff, and will, of course, automatically become a member of the Joint Chiefs. And Gen. Curtis E. LeMay, long-time head of the Strategic Air Command, has been named next Vice Chief of Staff.

Meanwhile, to replace retiring Deputy Secretary of Defense Reuben Robertson, Jr., President Eisenhower nominated AF Secretary Donald A. Quarles, scientist and businessman, who has proved himself a capable administrator.

To replace Mr. Quarles in the top civilian job in the Air Force, Mr. Eisenhower named former AF Under Secretary James H. Douglas, a lawyer and investment banker who has been in his Air Force post since 1953.

The new Air Force Secretary, who is 58 and was born in Cedar Rapids, Iowa, served in both World Wars. He was Deputy Chief of Staff of the Air Transport Command in World War II, as a colonel. After the war he was a member of the Chicago law firm of Gardner, Carton and Douglas.

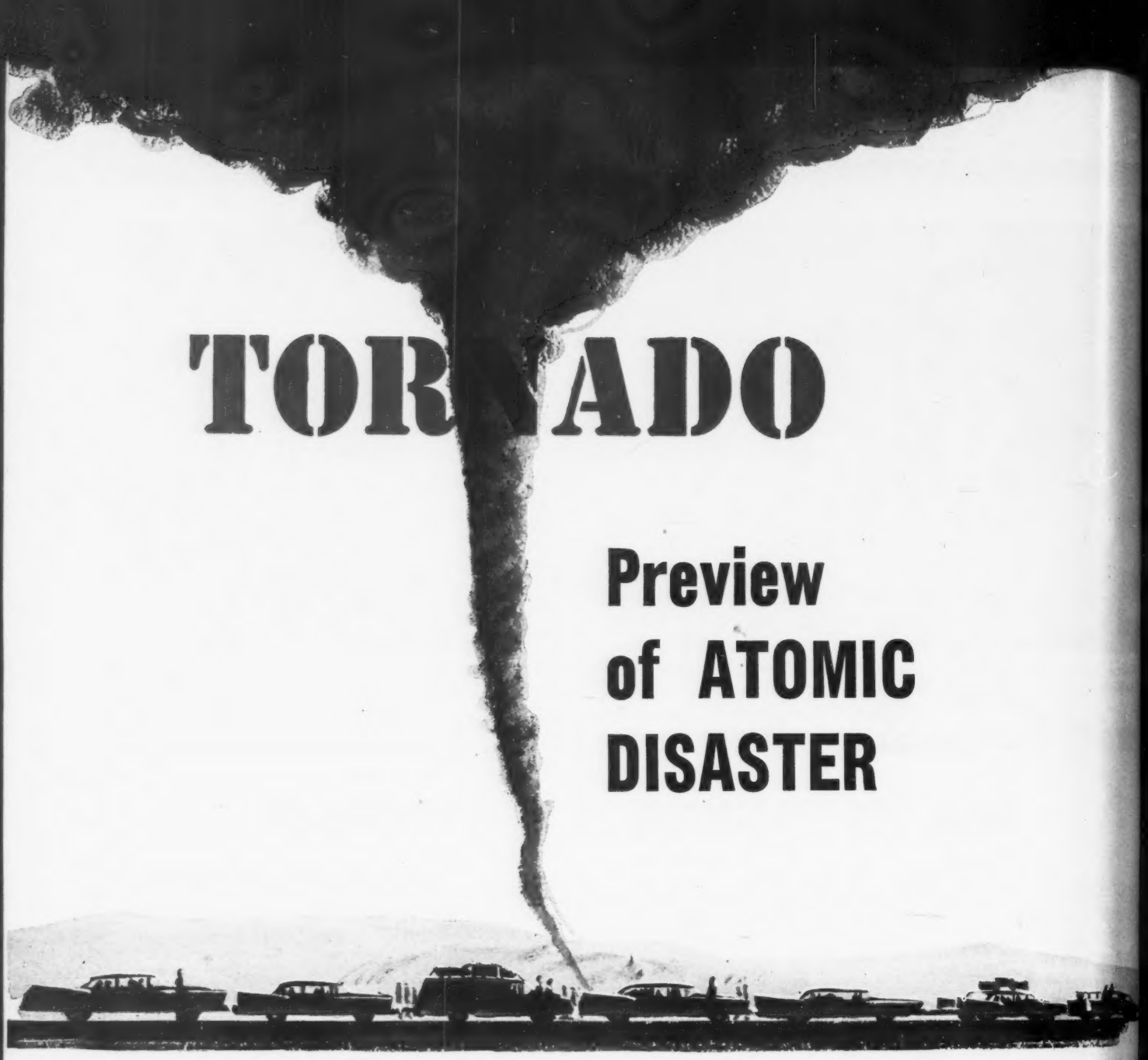
The other men involved in the command reshuffle are equally well qualified for their new posts—a fact that accounts, perhaps, for the popularity of the move, particularly in the press where the prospect of military leadership by Mr. Quarles and General Twining has been hailed as "a change back to a calmer, less opinionated leadership."

Mr. Quarles, a former electronics industry executive, was appointed Assistant Secretary of Defense for Research and Development in September 1953. Born in Van Buren, Ark., in 1894, he served overseas in the Army in World War I, and later became vice president of the Western Electric Co., and president of the Sandia Corp., before his appointment to the Defense Department.

He succeeded Harold E. Talbott to the AF's top civilian post in August 1955, when he was described by Defense Secretary Charles Wilson as a man "who sits next to God, has mechanical and financial experience, and can be confirmed by the Senate." Since that time Mr. Quarles has earned a reputation as one who takes a "broad view" of military policies.

For the nation's most senior job in uniform, General Twining is singularly well fitted. Though first and foremost an airman, he has been extolled for his fair-mindedness and his ability to stay calm under all circumstances. Both are qualities that cause the other services to be pleased with his appointment as Chairman of the Joint Chiefs. A 1918 graduate of West Point, General Twining commanded the Thirteenth AF in the South Pacific in World War II, later headed the Fifteenth AF in Italy, and commanded the Mediterranean Allied Strategic Air Forces. Fifty-nine years old and a native of Monroe, Wis., General Twining succeeded the late Gen. Hoyt S. Vandenberg as Air Force Chief of Staff in June 1953.

General White, the new AF Chief, is often described as a brilliant administrator. After serving as commander of the Seventh AF in WW II, he was Deputy Chief for Operations before becoming Vice Chief in 1953. His new second-in-command, General LeMay, who gained fame as the cigar-chewing, blunt-spoken head of SAC since 1948, is one of the few high AF commanders who is not a West Point graduate. As Vice Chief, his main responsibility will be administration of our globe-girdling Air Force.—END



TORNADO

Preview of ATOMIC DISASTER

By Al Harting

Early last month a Texas tornado cut a destructive swath through Dallas. In forty minutes the twister had shattered 125 homes, killed ten persons, and injured 200 more. It was a Texas-size disaster, yet not a patch on what a hydrogen bomb might do to Dallas—or any other American city. Here in the words of eyewitness Al Harting, whose office at Southwestern Airmotive was barely missed when the tornado skimmed by Dallas's Love Field, is a grim forecast of what might happen should the H-bombs start falling. He wrote it at our request the day after the storm, and in an accompanying letter asked us to remember that his comments were offered "Whilst I was still shook up." We were more than a little shook up ourselves, before we had finished reading Al's article. When one couples the Dallas experience with the Bikini test results, Harting's story becomes eloquent through sheer understatement.—THE EDITORS.

YOU can't dig a hole, your feet won't work, your mind is a nightmare of blind alleys, and suddenly everything that's familiar takes on the gray, dark shadow of unreality.

Then, because you must do something to re-assert a sense of struggle with the inevitable, you toss your two kids and your wife into the family car and "take to the hills," pointing the Pontiac's nose toward that only clear hole in the sky, out east.

A tornado's on the prowl. . . .

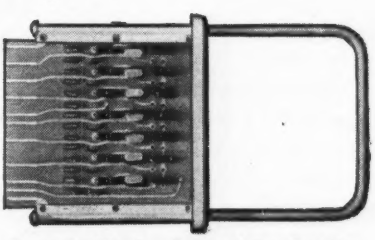
You have seen it and watched it in dumb, frozen panic out the back window, as it did its macabre dance in the direction of Love Field where you've just left your office at Southwest Airmotive. You're no expert on such things so you don't know which

(Continued on page 63)

SMALL WORLD—The world of the diode... the transistor... the printed circuit... the new magnetic and dielectric components—this world expands in significance as it shrinks in physical proportions. Popularly symbolized by the tinier-than-ever hearing aid and the pocket radio, the new, small world of solid state circuitry is omnipresent. It safeguards our skies. It simplifies our living. It opens new doors to learning.

Stewart-Warner Electronics has pioneered in the development of solid state circuitry. Out of a manufacturing environment second to none, Stewart-Warner Electronics is mass-producing equipment containing solid state devices by the thousands of units.

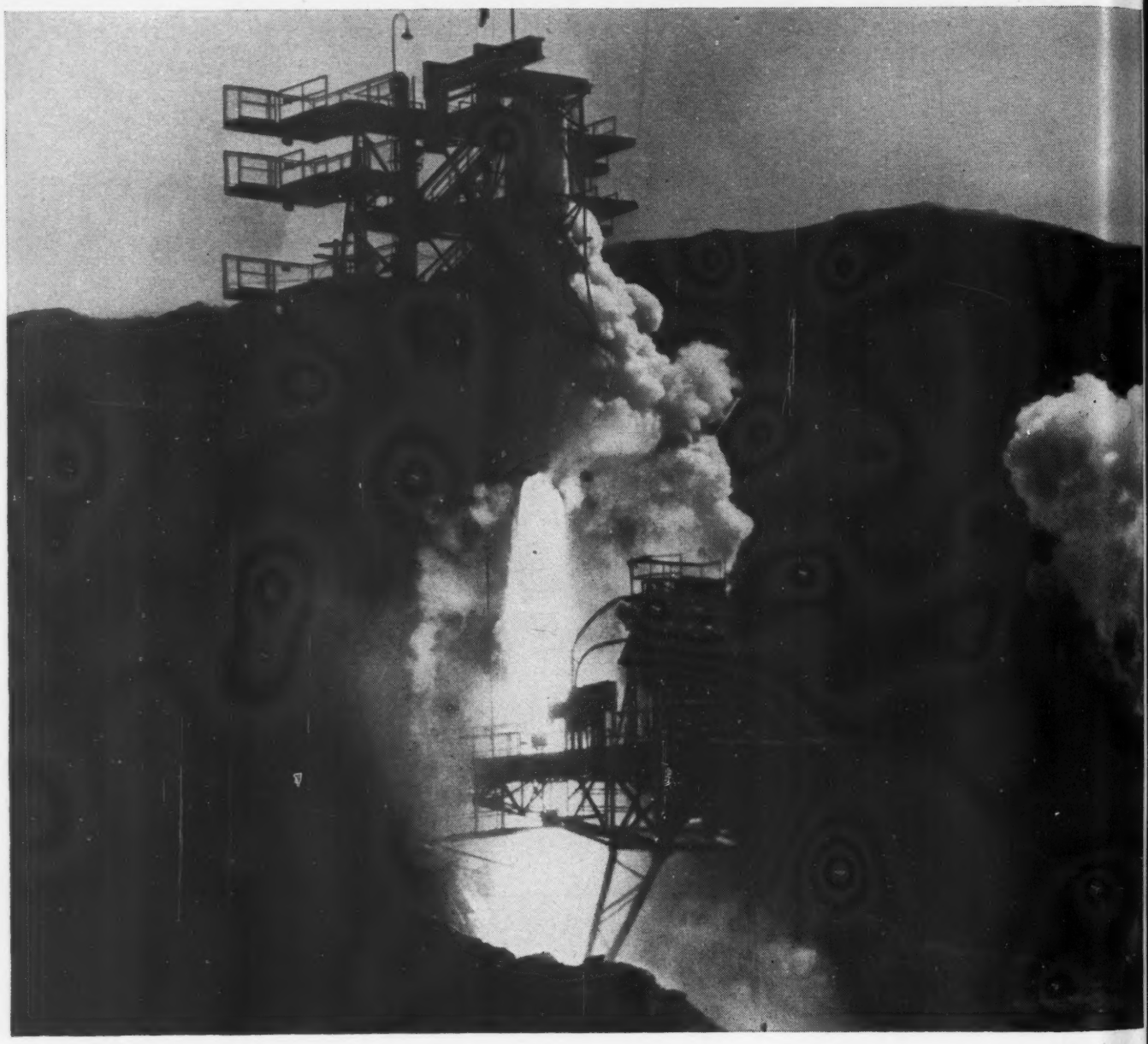
Your problem of solid state circuit design and production techniques will be handled at Stewart-Warner Electronics with equal efficiency. If you are an engineer interested in advanced circuit development, write: Stewart-Warner Electronics, Dept. 11, 1300 North Kostner Avenue, Chicago 51, Illinois.



One of 160 plug-in modules for the desk-size Stewart-Warner Data Processing Unit. Modules employ solid state circuitry to save space and eliminate many vacuum tubes.

STEWART SW WARNER **ELECTRONICS**

a Division of Stewart-Warner Corporation



Powerhouse of America's major missile programs

Every day at ROCKETDYNE's Propulsion Field Laboratory, deep in California's Santa Susana Mountains near Los Angeles, rocket engines developing millions of jet horsepower are tuned and tested for their ultimate job—to power America's long-range missiles.

These high-thrust engines—developing more propulsive power than anything before produced—are moving on schedule from ROCKETDYNE for delivery to the Armed Forces. By fall of this year other high-thrust production engines will flow from another plant now being activated by ROCKETDYNE in Neosho, Missouri.

As today's engines are being delivered, ROCKETDYNE engineers are constantly pushing ahead—evolving dramatic boosts in power outputs and engine performance.

This kind of tomorrow-minded engineering—conducted in a private enterprise system—is a keystone in the defense structure of the free world.

If you are interested in further details of ROCKETDYNE's operations, your inquiry is welcomed. Write ROCKETDYNE, Dept. F-72, 6633 Canoga Ave., Canoga Park, Calif., or Dept. F-72, Neosho, Mo.

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way it might go. You're also no hero, something you already knew which now re-affirms itself as your spine turns to jelly. So, you're getting the hell out. You think this is probably stupid. Okay, so you're stupid.

About right now, our hangar crew is huddled in the big hangar doors watching the tornado rumble up the airport's opposite fence line, chewing up the top of Johnson & Johnson's bandage factory, mangling Harold McElfish's parachute loft, and ripping apart T. J. Smith's air freight handling set-up over on Love Field Drive. This is about the time, too, that the comfortable home built by our propeller overhaul artist, Albert Lovely, is being swept entirely away, and the wife of Purchasing Agent Carroll Rather has ended her trip to pick him up by huddling beneath a machine in the engine shop with a crying mechanic.

The steering wheel feels good in your hands. At least you have some mobility in the face of the oncoming wind and debris, some chance to fight back. You travel six blocks through a familiar residential area and see scores of your neighbors, standing like statues in their yards, white faces turned behind you toward the monster. Others press their faces against the windows.

Your wife shouts "Look out!", and you're mildly surprised to find yourself driving on the wrong side of the street. You, too, have been looking back, hypnotized.

Suddenly, as if from nowhere, scores of other automobiles are in front of and behind you. A lone woman driver zigzags toward you, chewing frantically on her left fist. On each face, behind each rain-swept windshield, there is the same blank, bewildered look. And each pair of eyes gives the road ahead less attention than the funnel now sweeping on behind, north and east.

Traffic now moves at a latrine orderly's pace, jerkily, or not at all. Intersections are hopeless tangles. There's the far-off wail of an ambulance siren. It's crossing town, negotiating the packed and dangerous streets, en route to the disaster. It comes up behind slowly, weaving its way about the four-wheeled pillboxes of the masses.

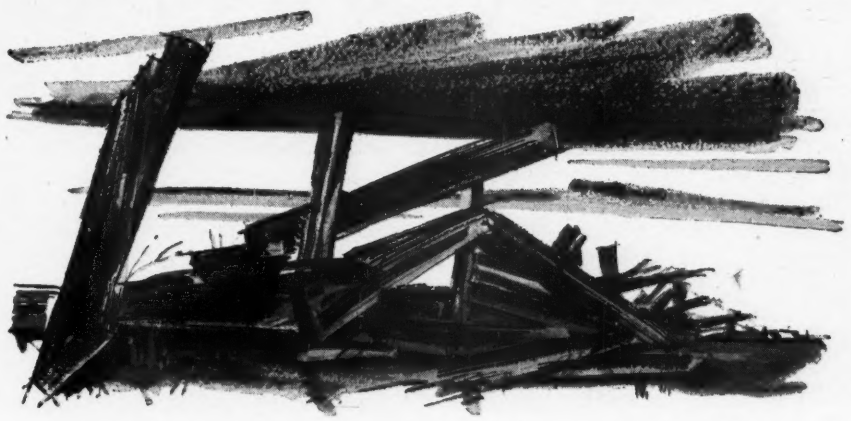
You feel trapped. You are trapped. As a matter of fact, you have no idea where you're going, anyway. There's a main artery leading out of town to the east. The outbound cars on it are bumper to bumper as far as you can see. A few hardy souls stand atop their cars to scan the skies.

Another look at The Thing, though, makes you realize it has missed you. Its shape is disintegrating as it lifts its stinger higher into the mass of a boiling black cloud. A needle of it droops down, poised, it seems, in a deliberate move to let you know it can, and perhaps will, punch down again if the fancy strikes it. And there it stays, drifting away with agonizing indifference.

As your radio squawks bulletins—with one station's mobile news unit actually careening along but a city block behind the funnel—you collect yourself and think:

"This is a kind of two-bit preview of what will happen when and if The Bomb is dropped on the country's second largest aircraft manufacturing center."

Magnify the afternoon of Tuesday, April 2, in Dallas, Tex., a million-fold and you have it under glass, on the slide, beneath the high-powered lens, in clear and horrifying focus.



What's left of Dallas will flee, senselessly, pell-mell, with stunned minds and reflexes, with the one objective to Get Away . . . Get Away . . . Get Away.

And, just as swiftly, it will resolve itself into a massive and immobile snarl, a glutted octopus, in an angry, insane, and dangerous mood.

The route we've blindly chosen this day is the one we'd probably use in going to our post in Civil Defense aviation headquarters—located in the State Fair Grounds, a good ten miles through the heart of Dallas's busiest traffic complex. We'd have played hob getting there today. If The Bomb were dropped, the trip would be impossible. Why not try Acapulco?

We've lived in Dallas for thirty-nine years and annually experience a mounting barrage of tornado alerts. Back when we were kids, there was no scientific weathercasting and no radio and TV to scare the bejeesus out of us beforehand. We just sat there, fat, dumb, and happy, and if we blew away, we blew away. No reason to sweat it out.

So on April 2, we saw the real thing for the first time. It isn't pretty. We're now contemplating things we've never contemplated before in the good old days of "It Can't Happen Here."

Our fine redwood fence we so diligently strung across the back yard six years ago now isn't a fence at all; it's an arsenal of potential splinters. That wonderful floor-to-ceiling window in the playroom has lost its charm; it's only waiting to spew broken glass in the direction of the bed under which we're hiding. The front entrance hall is no longer a hall—it's a kind of bomb shelter which we'll think about as a place to which to retire with the wife and kids, when bombs and tornadoes and such appear—but only until such time as we can rebuild with a concrete-and-steel basement—which might be able to double as a poker room.

At night, as we muse lazily abed, the unseen inkiness isn't a friendly blanket over our roof; it's a dark and foreboding avenue along which pass unpredictable and sometimes alien forces.

We think about these things not only as they relate to the tornado but also as they could relate to The Bomb. And, in both instances, we find ourselves face-to-face with frustration.

We're cheered today by the heroic and unselfish service of the police and fire departments, the hospitals and their staffs, the Red Cross, the Salvation Army, the ham radio operators, the CAP, the volunteer disaster corps, the churches, the friends and neighbors of the stricken, and by countless others.

We're cheered—but we're not misled.

We saw enough yesterday, in this small-scale but tragic tilt with the weather gods, to be appalled at the prospects of a visitation by the infinitely more lethal gods of war.—End

Capt. Ed Ferry, aircraft commander of one of the AF's RC-121s, lines his crew up for final pre-takeoff equipment check.

18 Men on a 12-Hour Shift

TAKE a Texas Tower, add a DEW Line and Ground Observer Corps, mix well with picket ships and a handful of long-range radar planes, season liberally with SAGE – that's the recipe for an air defense system to defend the US from nuclear attack.

Let's take a closer look at one of those "ingredients," and go along on a twelve-hour mission with a typical crew of one of the AF's Lockheed RC-121 Super Constellations.

We're briefed at 8:00 a.m. The aircraft commander outlines the mission and details each man's position on the big airplane. Besides the aircraft commander, the crew includes seventeen others—co-pilot, navigator, and engineer, plus radar operators and intercept directors.

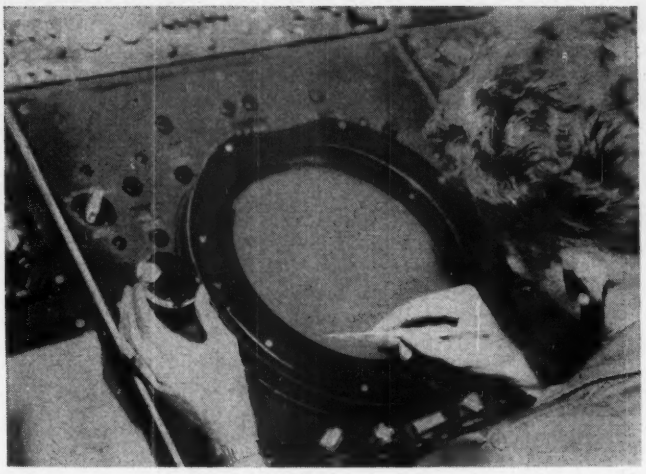
Check the weather. Line up for equipment inspection. Run through the seemingly endless check-lists, and finally taxi out for take-off. On the ground the radar Super Connie looks ungainly, with its long snout, shark-fin radar dome on top, and broad, protruding radome underneath. But once in the air, it's a real going concern.

Everyone at flight station, and the four engines roar as they begin their battle to lift the plane's 125,000 pounds off the ground. Then we're aloft, one of the many other such crews flying twenty-four-hour-a-day patrols off each coast of the US.

Once airborne, scope operators camp by radar sets—"eyes" of the Connie.

The radar operators feed information to the plotter and teller, who keep the record on vertical plotting board, also keep mainland control site posted.

If an "unknown" is spotted and our jets scrambled, the intercept director takes over to help vector the jets in.



Scope operators keep a close watch to determine range and speed of all aircraft approaching the US coast.

The radar Super Connie, a flying electronics laboratory, makes its way to the course it'll fly for the next twelve hours.

The RC-121 is a big plane but so crammed with electronic equipment that you can't do much prowling around during the next twelve hours. Look over the shoulder of one of the scope operators as he stares intently at the round screen. The residue of dots in the wake of the sweeping beam is the coastline. We're heading out over the Pacific.

If something sinister appears on one of the radarscopes—an unknown track or the blip of an unidentified aircraft—the information is immediately recorded on the vertical plotting board in the '121. And if identification can't be made, jet fighters back on the mainland are scrambled. Then the intercept director aboard the Connie takes over to vector the jets toward the bogies. It's all done in minutes.

But, today, nothing hostile shows up on the scopes. And finally the light begins to fade, and we head back to base. It makes a long day.—END

The day ends, the relief plane arrives, and this crew of the 552d AEW&C Wing has racked up another mission. The tired crew heads home, to McClellan AFB.

Abilene, now Dyess, AFB stands out as an example of fine community relations.

DYESS AIR FORCE BASE

Just West of Town

By Ed Mack Miller

ONLY a hoot and a Texas holler west of Fort Worth, sits the city of Abilene, where an inspiring story of civilian-Air Force cooperation has been quietly shaping up during the past four years.

Abilene is only a few miles from old Fort Phantom Hill, once an overnight stop on the Overland Route on the old Butterfield Trail. Bustling, burgeoning Abilene now has a population of 62,500 and is one of the commercial, medical, and livestock centers of West Central Texas.

Abilene's city planning reflects the pulse and vigor of youth. Its streets are wide. New office buildings are springing up all over, and new sections of swank, ranch-style mansions on the wide flanks of the town are fanned about modern swimming pools.

Abilene was good to the flyboys when they were roaring around in P-47 "Jugs" out of Tye Army Air Base back in World War II, and, in its gusty Texan way it has become a doting godfather to its proudest boast—Dyess Air Force Base, just west of town.

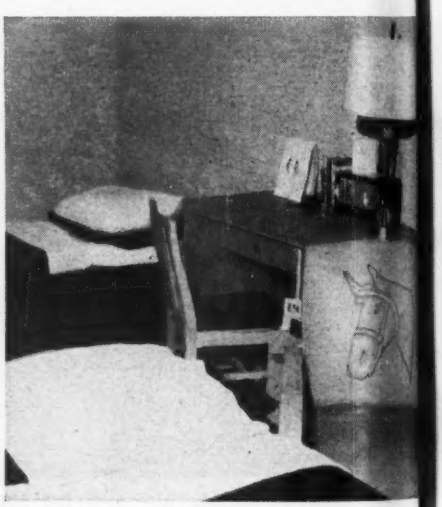
The new SAC base was born because it was wanted. It marks the second time in a generation that Abilene leaders have obtained a military base. Abilene citizens asked for and got their first installation during World War II in the form of Camp Barkley, a temporary site. But Abilene liked service people and wanted a permanent installation. After two years of effort in Washington, community leaders won a permanent air base—by the amazing expedient of launching it with dollars from their own pockets.

Civic leaders realized, logically, that there would be material benefits. And they seem to have hit the jackpot. The base has brought a $40 million piece of real estate to the town, and it could amount to $70 or $80 million under present plans. The construction work has brought added prosperity to building material suppliers throughout the area. Cement plants and brickyards have benefited especially, because of the large amount of brick and concrete used in the buildings and runways at the base.

This year a second wing is scheduled to move into Abilene. Each wing, composed of forty-five bombers and twenty tankers, represents an investment of some $200 million.

It takes about 3,000 personnel, plus dependents, to staff a SAC wing, and a wing's payroll averages out at close to $10 million each year, according to Air Force estimates (and this excludes the payroll for the Air Division and the Air Base Group, which are management and support units).

The drive for Dyess began one night in 1950 at a citizens' meeting in the City Commission Room at City Hall. Community leaders, city officials, and interested citizens at that session decided that, as long as the Russians were going to keep making faces, Abilene ought to do its patriotic part by requisitioning one government issue, M-1 air field.

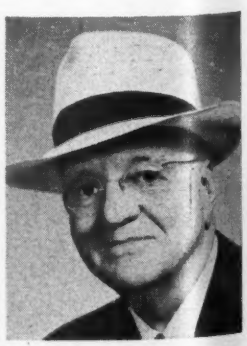


The old open-bay barracks give way to suite-type rooms, furnished like hotels.

One of the leaders of the "Let's-Have-an-Air-Base" drive was Howard McMahon, publisher of the Abilene *Reporter-News* and co-chairman of the Chamber of Commerce's National Defense Committee. The fifty-three-

Howard McMahon. Twenty-five hours a day on the project.

W. P. "Dub" Wright. Helped bring the SAC base to Abilene.



Dr. Harold G. Cooke. Leader of the fund-raising campaign.

year-old newsman, who is past president of the Chamber of Commerce and of the Abilene Club, worked "twenty-five hours a day" on the project.

Another civic-minded citizen who helped get the air base was W. P. "Dub" Wright. As co-chairman with McMahon of the Chamber's National Defense Committee (and a member of that committee since 1941), he had first worked to get Camp Barkley located near Abilene in World War II. In the campaign for the new air field, Wright headed delegations to Washington, greeted inspection teams, held receptions for visiting officials, conferred with city and Air Force officials, and attended uncounted hours of meetings on the project.

Out of the town meeting came Abilene's big try for an Air Force base. Wright and McMahon started hunting for a military installation. For a while it appeared that Air Training Command, with headquarters at Scott AFB, Ill., might move into Abilene, but nothing came of that.

In January 1951, McMahon set up a meeting of thirty or forty civic leaders. It was decided to try to raise enough money to donate property to the Air Force for the base. Later that month, McMahon, Wright, attorney Maurice Brooks, and restaurant-owner Jack Simons flew to Washington to begin a round of visits with Texas senators and congressmen and Pentagon leaders. They were met there by Joe Cooley, representing the Abilene Chamber of Commerce.

While they were in Washington, the Congress voted to expand the Air Force to 120 wings. The men went home heartened, but still without a base. In August of 1951, J. C. Hunter, Jr., Mayor Grissom, Cooley, and Dub Wright made another advance on the Potomac. They went from one Air Force office to another, selling Abilene. Everywhere the question was: "How will Abilene treat our service people?"

They invited the Air Force to come and see for itself, and an inspection team, headed by Col. J. E. Rodenhauser, came as representatives of Secretary Thomas Finletter. Abilene gave them a real "West Texas welcome," including barbecues, square dances, and all the "foofaraw" (Western talk for "all the trimmings"). The same treatment was given to inspectors from the Air Training Command and the Tactical Air Command.

But Abilene still wanted SAC, so Wright and Mayor Grissom flew to Omaha. They saw General LeMay and gave him their pitch. Wright and Grissom told him that, during World War II, Abilene had played host to as many as 79,000 men at Camp Barkley, that the city had grown from 26,000 persons to 40,000, that many of the young soldiers from Camp Barkley had married Abilene girls and had come back to live in Abilene, and that the city was proud of these men and their families. They told General LeMay that Abilene wanted the Air Force because it liked the Air Force, that Abilene wanted a part in the defense of the United States, and that Abilene believed in giving the airmen a fair break. They said that Abilene would work to make the men and women of the Strategic Air Command part of the community.

The general said he was more interested in how his men and their families would be treated than what type of real estate was available for an air field. General LeMay said the last base he would close would be the one at Roswell, N. M., because of the wonderful treatment given Air Force men there.

The two men left Omaha and were joined by J. C. Hunter, Jr., and Joe Cooley in Washington, again. At a party they met Secretary and Mrs. Finletter. They attacked, frontally and on the flanks. All the Air Force Secretary heard that night was Abilene.

The men went back to Texas and on January 17, 1952, a mass meeting was held in City Hall. At the meeting, Brig. Gen. Harold R. Maddux proposed that Abilene assist the Air Force in reopening the old Tye base. Chamber of Commerce leaders said that Abilene would put up the money to buy about 3,700 acres of land around the old Tye site. The City Commission agreed to deed the government the 1,500 acres of land at the old base itself, and, in addition, city leaders also offered to provide about $200,000 of additional amenities, including a downtown USO and two swimming pools. Later, the citizens agreed to furnish a VIP building and a swimming pool for the Officers' Club. Led by Dr. Harold G. Cooke, a fund-raising campaign brought in $893,261 to provide the city's share of the air base's procurement.

On May 1, 1952, Secretary of Defense Robert K. Lovett included a $32,273,000 request for the base at Abilene. Congress approved the appropriation on July 3, 1952, and Sen. Lyndon Johnson gave the Abilene city fathers the good news.

When the plans came through from Washington, they showed the base buildings built of frame and asbestos siding—the twenty-five-year type the Air Force was then using. Abilene leaders again got together.

"Why not," they said, "do away with the old open barracks and 'unclean latrine'? Why not give the SAC airmen dormitories instead of

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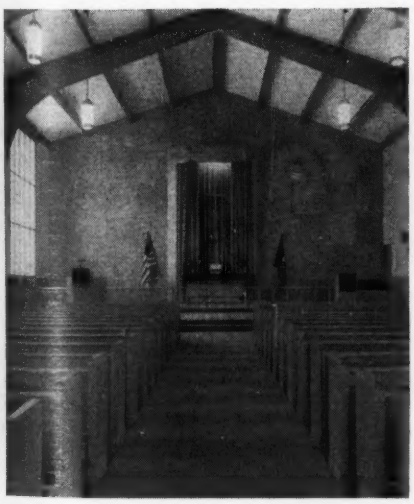
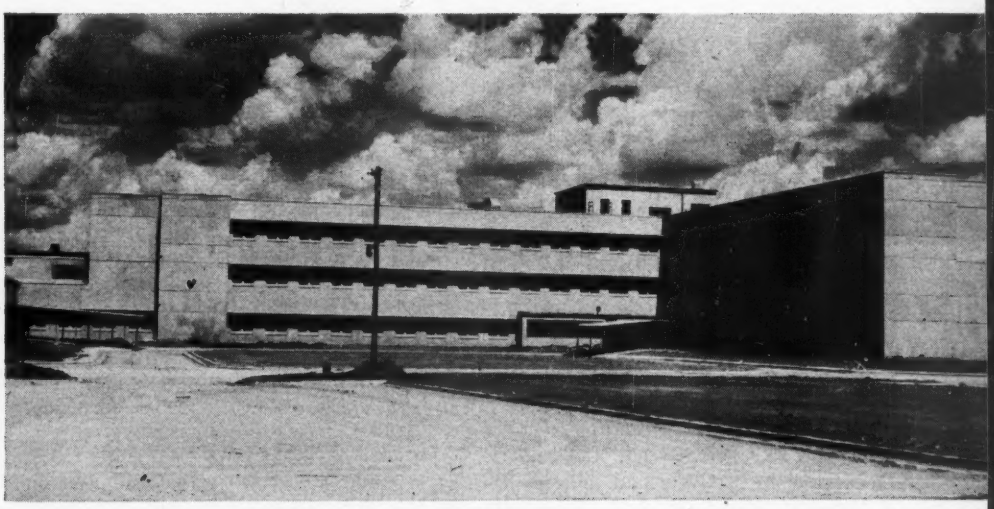


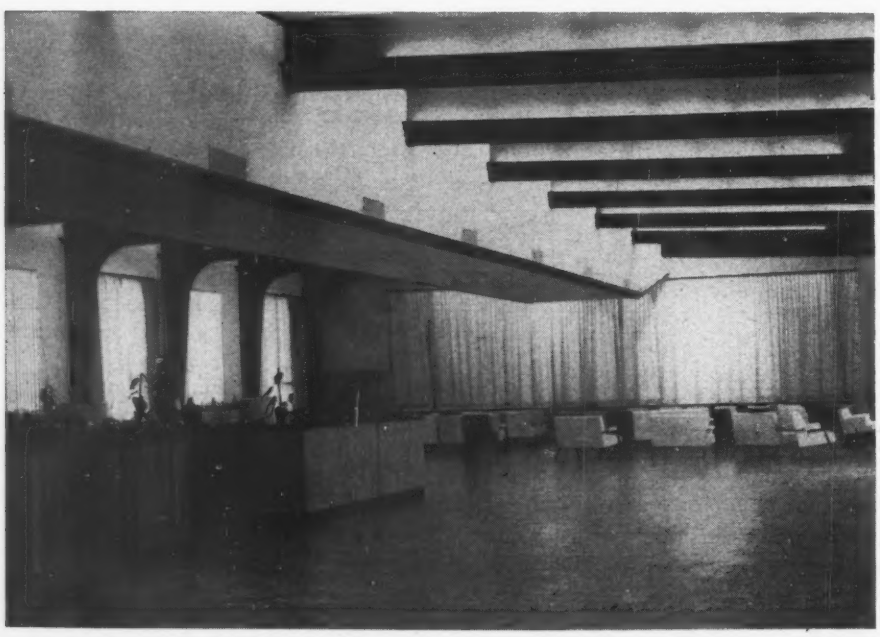
An important part of the Dyess building program was the chapel.



The new $2.7 million base hospital at Dyess is one of the first in the Air Force Hospital Construction program. Its three stories contain 500 rooms.

One of the reasons why the men of SAC like Abilene and Dyess AFB is that at the base people are the important thing. Here's one of the two pools.

Dyess has been described as resembling an ideal suburban city. One reason is the base exchange, hub of activity for the dependents living on the base. Here, SAC wives are able to buy a variety of goods, attractively displayed.



A good example of the "new look" at Dyess is the Service Club, built for the airmen stationed there. It has a large lobby and ballroom with built-in stage.

barracks, with only two or three to a room (and with connecting bathrooms, suite-style)? And why not furnish them like hotel rooms?"

That's how Dyess became the pride of SAC. The result is both businesslike and beautiful. The red brick buildings, obviously Texan in the ramble of their architecture, presage a trend that could profitably extend itself the length and breadth of the Air Force.

One of the most unusual features of Dyess is the new $2.7 million base hospital, one of the first in the new Air Force Hospital Construction Program. The three-story structure of concrete and steel encloses nearly 500 rooms and is designed to accommodate 150 beds. There are four operating rooms and other special treatment rooms. The hospital includes an X-ray clinic, dental clinic, eye-ear-nose-and-throat clinic, and an orthopedic clinic —and even offers seventeen maternity beds, two delivery rooms, two labor rooms, and a nursery for twenty babies.

On first inspection, the base suggests an ideal suburban city, with its attractive theater, two swimming pools, a "shopping center"-type base exchange, and a strikingly simple chapel. The smartly styled Officers' Club is one of the finest in the Air Force. A "new-look" NCO Club has also been built, and for the airman there is a plush Service Club which cost $350,000. It has a main ballroom with a spacious stage, a snack bar, TV and reading rooms, game rooms, and a large lobby.

But probably the most unusual building is one that Abilene's citizens donated—the plush "VIP" quarters, which cost more than $70,000. In charge of the project was the National Defense Committee of the Chamber of Commerce. The building has floor-to-ceiling windows in many of its eleven rooms; one conference room is twenty-two by forty feet, and there is a special suite for "very-very VIPs." The bedrooms have wall-to-wall carpeting, hidden lighting, and redwood paneling. The VIP building is located just across the swimming pool from the Officers' Club in the central area of the base.

But Abilene still had to sell itself to the airmen. Before wrinkles had ever begun to appear on the fabric of air base-community relationships, it took action to keep the fabric smooth.

The city set up a limited annexation status for the clusters of new homes going up between Dyess and Abilene, passed new zoning laws, laid in a

(Continued on page 71)

ALLISON POWERS

-THE LOCKHEED C-130 HERCULES

The prop-jet Hercules can take off with a 5,000-gallon tank truck — or 20 tons of combat cargo — and get to the scene of action close on the heels of the fastest jet bombers. Four Allison T56 Prop-Jet engines, driving Aeroproducts turbo-propellers, give it speeds of over 370 mph; range over 3,000 miles; and the ability to take off and land on hastily prepared air strips. The Lockheed C-130 is the backbone of the Tactical Air Command's combat support operations.

A commercial version of the Allison T56 will soon power America's first prop-jet airliner, the new Lockheed Electra. Allison engines are designed and built by America's pioneer producer of turbine aircraft engines.

ALLISON DIVISION OF GENERAL MOTORS — Indianapolis, Indiana

ALLISON *Prop-Jets and Turbo-Jets*

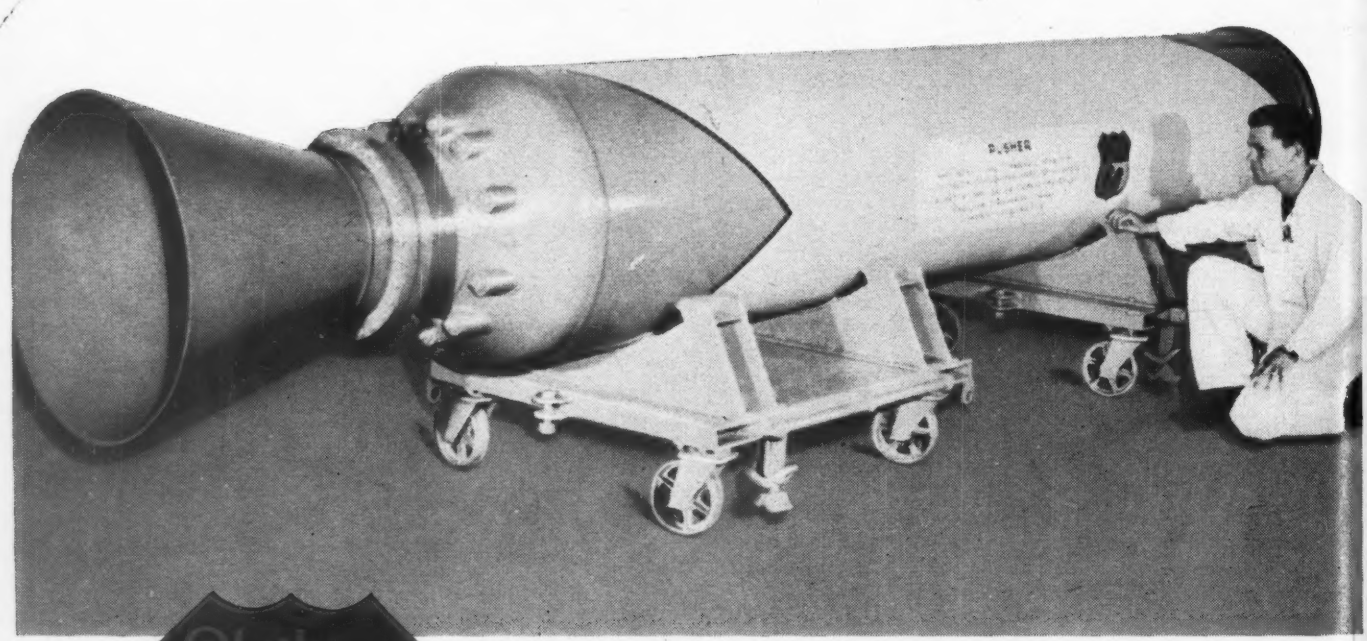
GM AIRCRAFT POWER

PUSHER

A giant, booster-type rocket, developed by Phillips Petroleum Company, powered by low-cost petroleum-derived materials.

The "PUSHER" rocket is one of a series of booster-type rockets successfully designed, developed, and test fired by the Rocket Fuels Division of Phillips Petroleum Company at AF Plant 66, near McGregor, Texas. Phillips family of solid rocket propellants . . . made from easily obtainable materials such as ammonium nitrate, synthetic rubber and carbon black . . . are being used in rocket motors for JATOs, extremely large boosters, and in other applications. They are insensitive to detonation by impact or explosion . . . operate successfully from −75F to 170F . . . can be stored for long periods. The exhaust gases are noncorrosive and relatively low in temperature. And included in this family of rocket propellants is the solid propellant used in the M15 JATO . . . the only JATO of this type to fully qualify without deviation under the Air Force's most stringent performance requirements.

Our staff of skilled scientists and engineers is available for help in solving problems in propulsion systems, primary rockets, booster rockets and other related matters. We invite you to discuss your technical and production problems with us.



Phillips 66

PHILLIPS PETROLEUM COMPANY

Bartlesville, Oklahoma

ADDRESS ALL INQUIRIES TO: ROCKET FUELS DIVISION, McGREGOR, TEXAS

labyrinth of sewers and other utilities, set up a master plan to make sure Dyess children would have adequate school facilities, and worked out a myriad of other problems involved in building $70 million worth of city and assimilating thousands of new citizens into their economy.

Typical of why SAC men like Abilene is the case of Lt. Col. S. R. Smith, a squadron commander, who bought a home that in most metropolitan areas would have cost at least $5,000 more. It is like a page out of *Better Homes and Gardens.* Colonel Smith also has a motorboat-trailer combination, which he takes to nearby Possum Kingdom Lake for boating with his two boys and his German shepherd dog.

"If all SAC bases could be like this," says Colonel Smith, "you couldn't keep the civilians out of the Air Force."

Solid proof of this is found in statistics, released late in 1956, showing that the base ran second in SAC in reenlistments, with sixty percent of the men signing up for another hitch.

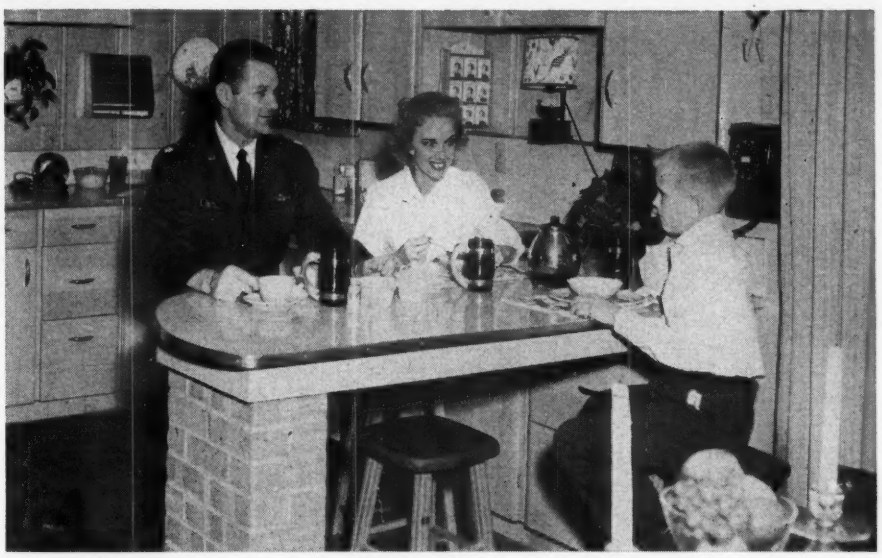
What has this modern approach done for the city of Abilene? What does the city have to show for the $893,000 it raised to build the base?

Figures talk. In the past six years, employment has zoomed to the city's highest level. More groceries are sold and more gasoline consumed. More houses are being rented. More money in the cash registers. More money in the pocket. More than ever before in the city's history.

The people realize what a bonanza they have. But, although an air base is a lucrative thing, many communities don't want to shoulder the additional responsibilities an air-age installation brings. So there must be much more besides the desire for profit that motivates the fine citizens of Abilene.

"I like Abilene," one airman told the writer. "Sure, it has its blue northers and black dusters, its sandblast and its sunbake—but a guy doesn't mind that when the people treat him and his family as real friends."

Mayor Gatlin says, ". . . It seems to me the fine cooperative spirit and mutual understanding existing between the city and Dyess AFB is intangible. . . . You see, the 'Story of Dyess Air Force Base,' is in reality the 'Story of West Texas.' I might add that the Air Force personnel have accepted us at face value, and this in turn has enhanced the relationship between the civilians and the base personnel. . . ."



Lt. Col. S. R. Smith, now commanding 10th Bomb Squadron at Dyess, left airline flying to rejoin AF. Here he's at breakfast with his wife Jynnie, and son Robbie.

This cooperation is a two-way street. The air base has extended every effort to assist the city at any time, under any situation. The city has been amply repaid, beyond mere money, for its hospitality and interest. At Abilene's Diamond Jubilee Pageant, for example, eight officers in full flying gear helped put over the theme, "Saddles to Jets."

When a downtown department store caught fire, the base sent three fire trucks and seventy-five men in shifts to help fight the stubborn blaze. Airmen from the 341st Field Maintenance Squadron manned Salvation Army booths during a fund drive. Military personnel and their wives are active in sixteen different church choirs. One airman is assistant pastor in an Abilene church. One airman runs a Little League baseball team. Base wives are Brownie leaders and Girl Scout Troop leaders in Abilene. Military personnel have donated blood at local city hospitals.

When Abilene's Christian College Olympic champion Bobby Morrow returned with three gold medals, Dyess

(Continued on following page)

SAC men at Dyess have learned you can make friends by getting together with the townspeople. Here an officer takes part in Abilene's Diamond Jubilee.

Kids from Abilene, or any town, like nothing better than seeing jets close-up.

airlifted a band and drill team from Roswell AFB, N. M., to march in the parade. An air base major emceed a polio telethon for six hours, and sixteen base airmen put on acts to help. When the city held a polio balloon sale, Bob Tiffany of Abilene's Lions Club had this to say: "Without the fifteen trucks and drivers from Dyess Air Force Base, the drive would have been a failure."

There have been more than 100 base tours, and a number of service clubs have had luncheon meetings in the Officers' Club. At a Christmas parade, when two jeeps were needed to tow floats, Dyess sent them. Fifteen airmen attend luncheons each month with different civic groups. The base furnishes speakers at clubs, luncheons, schools, churches, and graduation exercises constantly.

On Aviation Day at Abilene Municipal Airport, men from Dyess collected tickets, directed traffic, parked airplanes, and helped out in many other ways. When the town of Rising Star, sixty miles southeast of Abilene, requested an airpower display for their fair, Dyess dispatched an officer and two airmen for three days and nights to man booths.

A base wives' club bought and decorated Easter baskets, sold them for $5 apiece, and gave all profits to the West Texas Rehabilitation Center. Explorer Scout Troops have held encampments on the base, eating in mess halls, sleeping in dormitories, and getting flights in aircraft.

On Kids' Day, 3,000 youngsters toured the base. At Christmas time, after the officers' wives' children's party, all presents brought by youngsters were donated to the Texas State Hospital for mentally retarded children. When Abilene held its United Fund drive, the base raised almost $10,000 to help the city drive go over the top.

The base itself is named in honor of the late Lt. Col. William E. Dyess of nearby Albany, Tex., who died in the crash of the P-38 he was piloting on December 2, 1943, when the plane caught fire above the residential area of Burbank, Calif. Colonel Dyess stayed with his fighter, diving into a vacant lot and electing to die rather than to kill anyone in an adjacent, traffic-choked street.

Top SAC man at Dyess is Brig. Gen. Charles B. Westover, Commander of the 819th Air Division (no kin to Maj. Gen. Oscar W. Westover, for whom Westover AFB, Mass., was named). A West Point graduate, class of 1937, General Westover served with the Eighth Air Force in World War II and came to SAC in 1952. During Korea, he served as Commander of the 98th Bombardment Wing, FEAF, until June 1952 when he took over the 12th Air Division at March AFB, Calif.

Although General Westover is the top-ranking officer at Dyess, a permanent base commander, Col. Louis A. Rochez, III, is assigned under the SAC system of having a permanent staff run the base in case of rotation or reassignment of division or wing commanders.

Colonel Rochez is an example of a new trend in SAC, giving command to air crew members other than pilots. A senior observer (bombardier-navigator-radar observer), Colonel Rochez, who is thirty-six, served in Europe, the Middle East, and North Africa in World War II, taking part in thirty-six combat missions during that time, including the first mass low-level raid against Ploesti, Rumania, August 1, 1943, where he was bombardier in the lead aircraft of the 376th Bomb Group.

Commander of the 341st Bomb Wing is Col. Frank P. Sturdivant, who got his wings at Kelly Field in 1939, flew B-29s against the Japanese, served in FEAF until 1947, and, after a Washington tour and an Air Command School assignment, joined SAC, commanding Forbes AFB in Kansas until May 1, 1955.

They are proud of the Air Force, of SAC, of Dyess, and the men who serve there. But their pride extends beyond the limits of their military duties and surroundings. They're proud of Abilene, too, and mostly because Abilene is so proud of them.—END

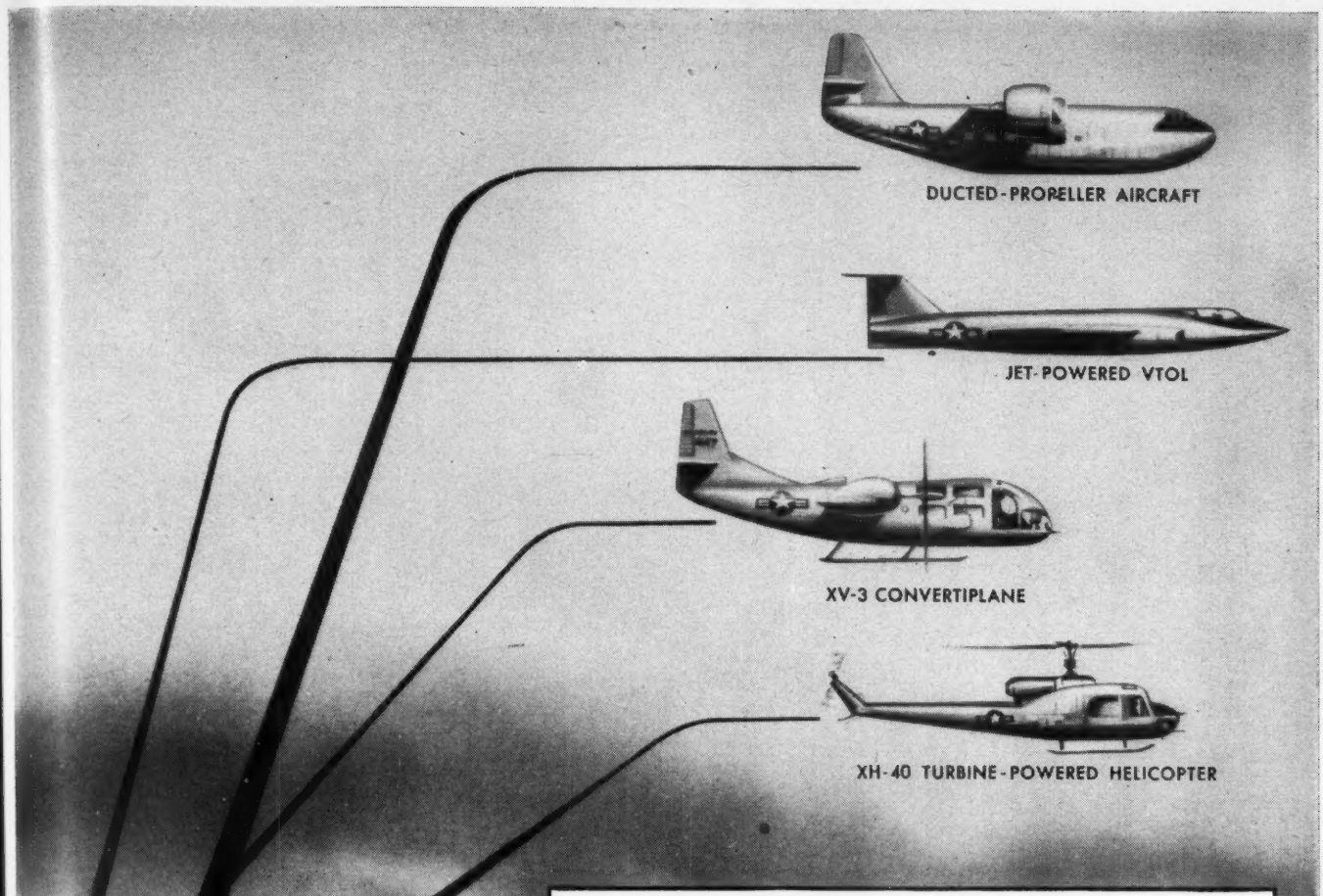
General Westover
Division Commander

Colonel Rochez
Base Commander

Colonel Sturdivant
Wing Commander

ABOUT THE AUTHOR

Ed Mack Miller is one of our regular authors. He lives in Denver, where at the annual dinner of the Colorado Author's League recently he received two of the group's top awards—one in the "short story" category and the other for "factual article." The latter was for his "Eggheads in Hard Hats," which appeared in our October '56 issue. Since then Ed's written "Window Into Space," which was in the December '56 issue of AIR FORCE, *and "Raoul Lufbery, Man of Mystery," in January '57. An active free-lance writer (he's now finishing a book on SAC), Ed is also a flight instructor for United Air Lines. He also finds time to fly for the Colorado Air National Guard, in which he's a major with more than 7,000 hours of flight time. He's married and has three boys and four girls.*



VTOL

...new dimensions of FLIGHT

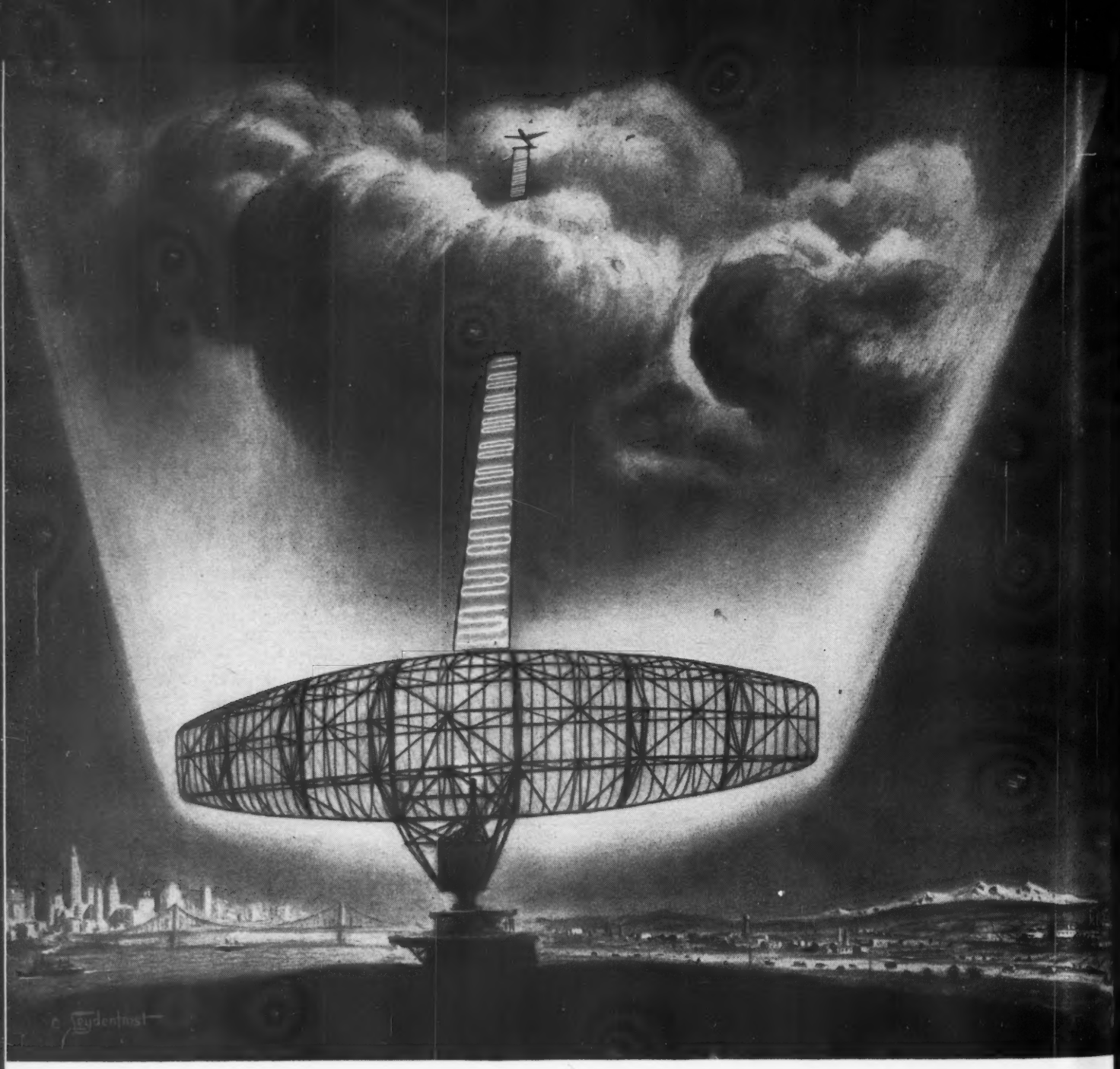
BELL AIRCRAFT has kept pace with the need for greater operational mobility and flexibility in both military and commercial aviation by developing four basic types of VTOL (vertical-take-off-and-landing) aircraft.

Studies and development work on a ducted propeller prototype have advanced to a point where this new design concept is fast approaching reality at Bell. The X-14 uses new principles of jet propulsion to take off and land vertically with the airframe in a normal horizontal position. The XV-3 convertiplane takes off like a helicopter, but as its rotors tip forward in flight, it becomes a normal, fixed wing aircraft. The XH-40 turbine-powered helicopter has substantially increased speed and payload and the ability to use a wide range of fuels.

The skillful and imaginative type of research which was the forerunner of these projects is being carried steadily forward at Bell Aircraft in the interest of still further scientific advancements in the commercial and military aircraft of tomorrow.

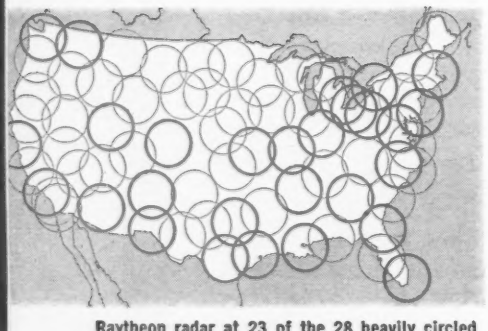
BELL Aircraft CORP.
BUFFALO N.Y.

RESEARCH, DEVELOPMENT and PRODUCTION IN THE FIELDS OF: Guided Missiles • Research Aircraft • Servomechanisms • Electronics • Rocket Engines • Electronic Control Devices • Vertical Rising Aircraft



C.A.A. buys 23 new Raytheon "Flight-Tracker" Radars

Long-range equipment to speed schedules, reduce "stacking" and air lane congestion; assure positive air traffic controls—create "more sky to fly in"



Raytheon radar at 23 of the 28 heavily circled areas will be an integral part of C.A.A. control network. Light circles indicate future coverage.

The Civil Aeronautics Administration has just taken a giant step to solve aviation's biggest problem: air traffic control.

New Raytheon radars with huge 40-foot antennas will be a key part of a complex nationwide air surveillance system that follows and helps safeguard all aircraft during every stage of flight. Radar scopes that display air lane maps pinpoint plane positions at distances up to 200 miles, altitudes to 70,000 feet.

These "Flight-Tracker" radars detect and track aircraft in all kinds of weather—even see through storms. A unique indicator tells the operator when the unit needs servicing.

By making possible precise new air traffic patterns, by speeding arrivals and departures, Raytheon radar readies the air lanes for the Jet Age. Here is another instance where Raytheon's "Excellence in Electronics" clears a roadblock from America's path to air progress.

RAYTHEON MANUFACTURING COMPANY

Waltham 54, Massachusetts

RAYTHEON *Excellence in Electronics*

THE PURPOSE OF WAR

The temptation in planning strategy is to substitute power for conception, to identify doctrine with the maximum development of strength. But a basic change in the nuclear age is that victory in an all-out war has lost its traditional meaning. With conventional technology, the side which could mount a superior offensive effort would generally retain a sufficient margin to impose its will. In a thermonuclear war, on the other hand, a superior offensive effort may prove strategically insignificant because even the weaker side may be able to inflict a degree of destruction which no society can support. The doctrinal challenge of the nuclear age is therefore the ability to use force with discrimination and to establish political goals in which the question of national survival is not involved in every issue. Strategic doctrine can no longer confine itself to the problem of providing the weapons for war: it must also relate them to the *purpose* of war.

Against the ominous background of thermonuclear devastation, the goal of war can no longer be military victory as we have known it. Rather it should be the attainment of certain specific political conditions which are fully understood by the opponent. The purpose of limited war is to inflict losses or to pose risks for the enemy out of proportion to the objectives under dispute. The more moderate the objective, the less violent the war is likely to be. This does not mean that military operations cannot extend beyond the territory or objective in dispute; indeed, one way of increasing the enemy's willingness to come to terms is to take away from him something which he can regain *only* by making peace. But it does mean that the conduct of a limited war cannot depend on military consideration alone; it must reflect an ability to harmonize political and military objectives. A "purely" military decision in a limited war is, therefore, a contradiction in terms.

A war between major powers can remain limited only if at some point one of the protagonists prefers a limited defeat to an additional commitment of resources or if both sides are willing to settle for a stalemate in preference to an assumption of continued risk. In either case, however, the protagonists retain the *physical* ability to increase their commitment. To the extent that both sides do increase their commitment, the war will gradually expand until one or both powers reach the limit of their physical resources —until the war has become total. To the extent that only one side is willing to run greater risks it gains an advantage. The ability to conduct a limited war depends, therefore, on an understanding of the psychology by which the opponent calculates his risks and on the ability to present him at every point with an opportunity for a settlement that appears more favorable than would result if the war were continued.

With a doctrine of limited war, many of the long-cherished notions of warfare will have to be modified or abandoned. One of the cardinal principles of air strategy is that wars can be won only by dominating the air space completely. But any attempt to deprive an enemy of his retaliatory force would inevitably bring on all-out war. Confronted by the prospect that it will be completely impotent once its retaliatory force has been destroyed, a power will almost certainly decide to use it to deprive its opponent of the means to impose his will. Thus, the minimum condition for limiting war will be the immunity of the enemy's retaliatory forces.

Even control of the air over a combat zone will be increasingly irreconcilable with a policy of limited war, particularly if control requires deep penetration of enemy territory. For the enemy is likely to interpret any deep penetration as an approaching attack on his retaliatory force. In any war between major nuclear powers, sanctuary areas immune to attack will be almost essential.

Limited war cannot be conceived as a small all-out war characterized by a series of uninterrupted blows mounting in intensity until the opponent's will is broken. On the contrary, it is important to develop a concept of military operations conducted in phases which permit an assessment of the possibilities for settlement at each stage before recourse is had to the next phase of operations. Paradoxical as it may seem in the jet age, strategic doctrine should address itself to the problem of slowing down, if not the pace of military operations, at least the rapidity with which they succeed each other.

We must never forget that henceforth the purpose of strategy must be to affect the will of the enemy, not to destroy him, and that war can be limited only by presenting the enemy with an unfavorable calculus of risks. This requires pauses for calculation. Every campaign should be conceived as a series of self-contained phases, each of which implies a particular political objective, and with a sufficient interval between them to permit the application of political and psychological pressures.

Therefore, it will also be necessary to give up the notion that direct diplomatic contact ceases when military operations begin. Rather, direct contact is essential to ensure that both sides possess as much information as possible about the consequences of expanding a war and are able to present political formulas for a settlement. To the degree that diplomacy produces alternatives to expanding a conflict, it will inhibit the decision to run greater risks. To the extent that military operations can be conducted in stages, it will give an opportunity for an evaluation of the circumstances that make a settlement advisable. Not the least of the paradoxes of the nuclear age may be that lack of secrecy may actually assist in the conduct of military operations, and that in a period of the most advanced technology battles will approach the stylized contests of the feudal period, which were as much a test of will as a trial in strength.

Such a change in traditional notions of warfare will not be simple to bring about. On closer examination it may even prove technically impossible. But the discouraging aspect of so much of our thinking about strategy is its refusal to admit that the new technology requires a new order of tactics. Instead we tend to add nuclear weapons to existing strategy as merely a more efficient explosive. This will not only produce appalling casualties; it also may not be adequate to the challenges we will confront. Any progress in our manner of conducting war must therefore be preceded by a doctrinal revolution. We must recognize the new strategy conceptually before we can explore its technical feasibility. It is, to be sure, a tremendous task, but history will not excuse the inadequacy of the response by the vastness of the challenge.

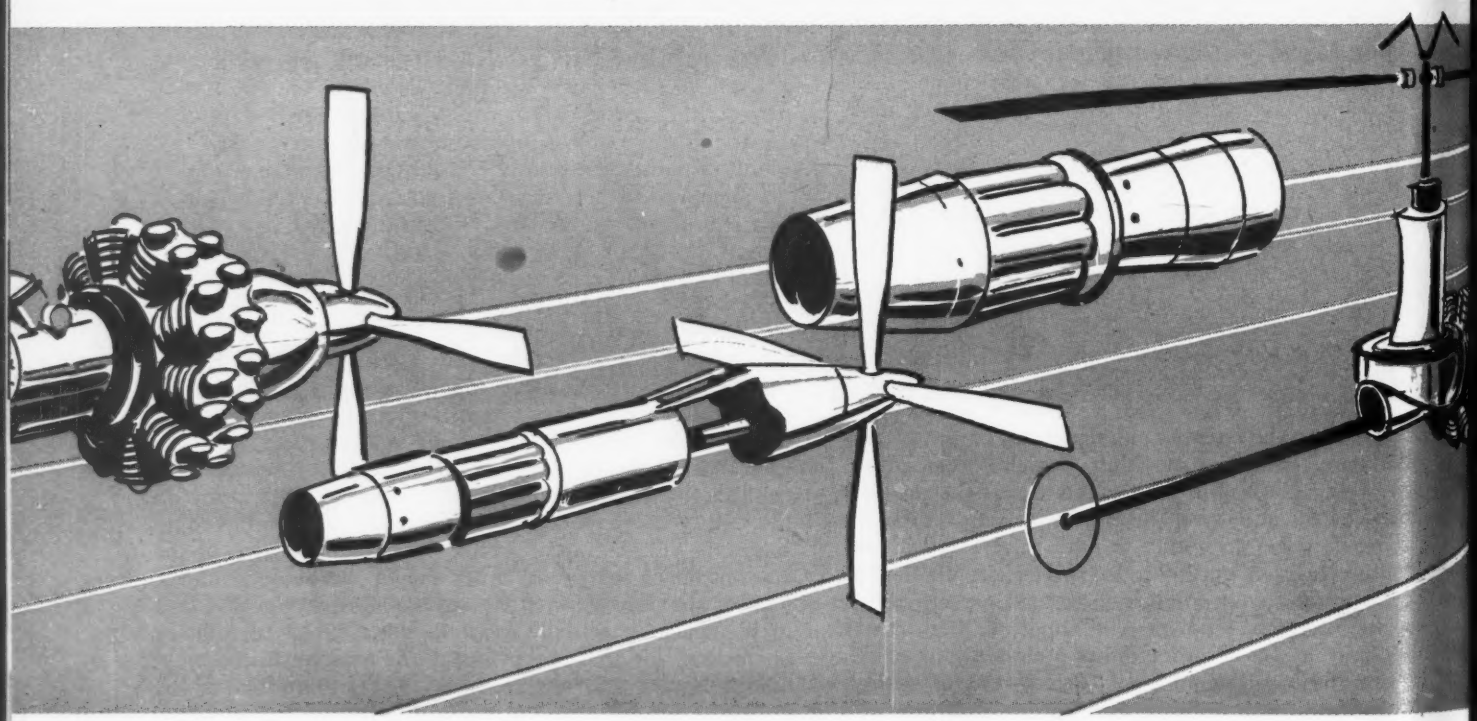
(Continued on page 78)

SMALL JET ENGINES... CHAMPION WEIGHT LIFTERS

An entirely new family of aircraft will evolve from a new family of small lightweight jet engines now under development at the Fairchild Engine Division. These new powerplants will feature incredibly high thrusts and great lifting power...yet will be so light they can easily be carried by two men.

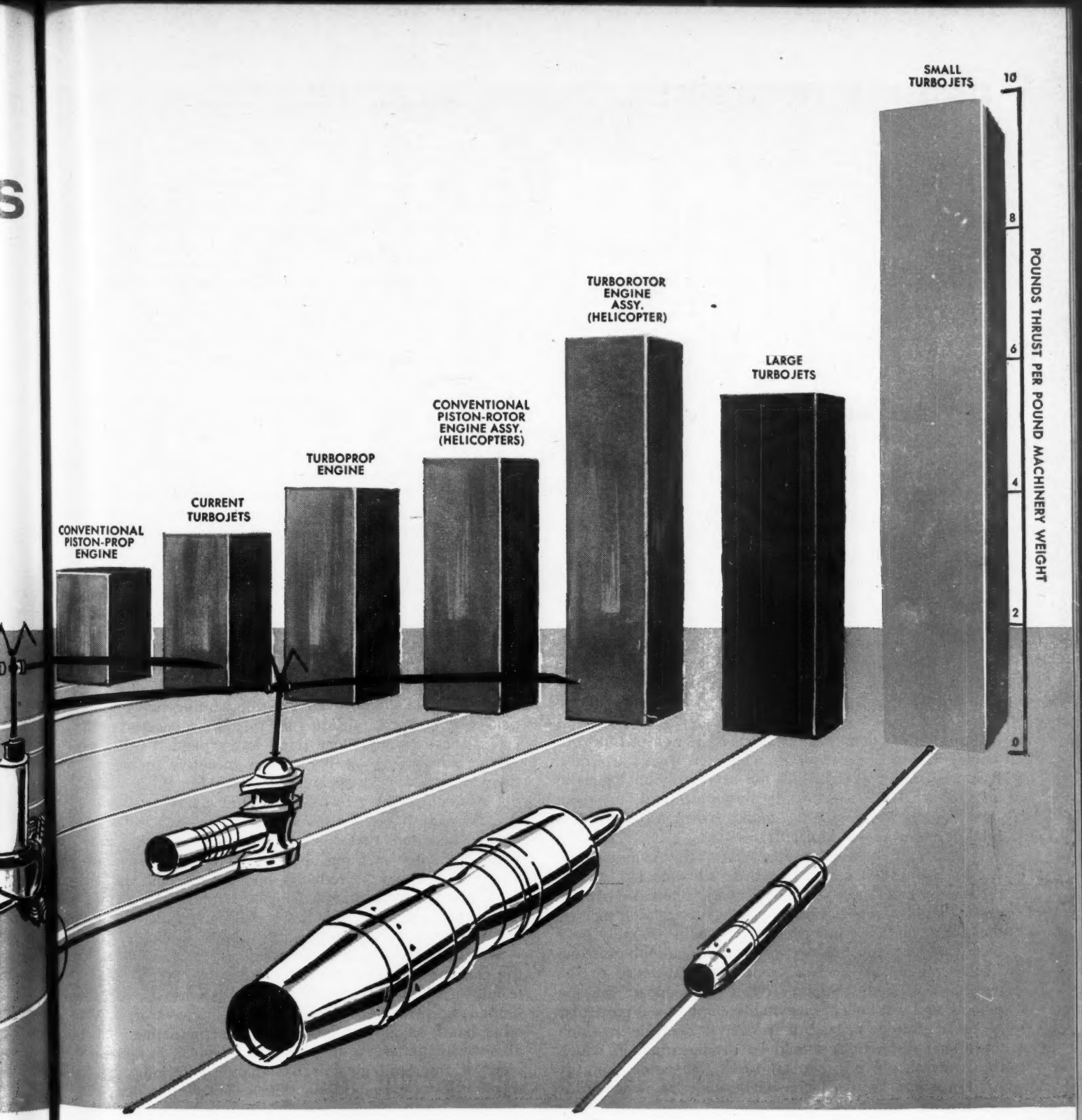
Highly compact, with low frontal areas, the small jet engines will deliver thrust/weight ratios starting at 8 to 1 with a long range potential of more than 10 to 1. They will be used in the high performance, lightweight trainers, interceptors, target drones, pilotless aircraft including missiles and intermediate class passenger and cargo jets of the nineteen sixties. They will also be used to power fighters and utility cargo craft, executive aircraft... and will make jet Short Take Off and Landing (STOL) and Vertical Take Off and Landing (VTOL) aircraft practical.

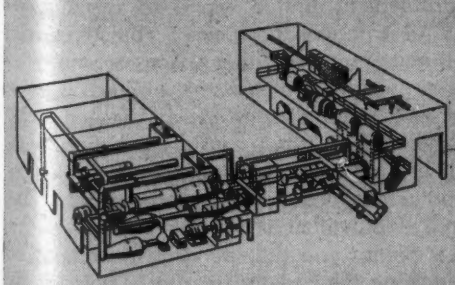
The small jet engine may be used singly, in pairs and in clusters. It provides multi-engine reliability in aircraft of a size now wholly dependent on a single engine. The small jet engine will produce greater versatility and utility in airplanes of tomorrow.



COMPARISON OF LIFTING CAPACITY OF POWER SYSTEMS

How the new family of Fairchild Small Jet Engines
compare with other mechanical lifting systems.





The extensive research facilities at Fairchild Engine Division have been designed solely to test performance of the small jet engine. They range from full scale, high altitude test chambers to supersonic research for component design. Fairchild Engine Division has spent a decade in the design, development and production of small, powerful jet engines.

FAIRCHILD
ENGINE DIVISION

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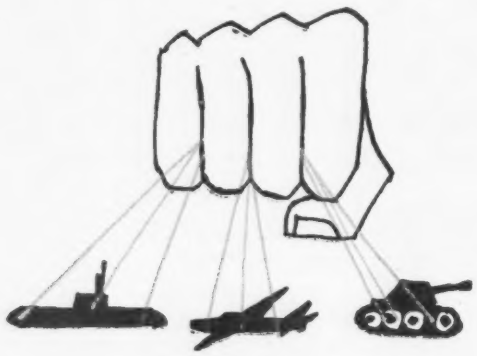
...WHERE THE FUTURE IS MEASURED IN LIGHT-YEARS!



REORGANIZING THE MILITARY STRUCTURE

Among the obstacles to an adequate response is the organization of our military establishment. To develop a strategic doctrine requires an administrative structure which leads officers to reflect spontaneously about questions of over-all concern throughout their careers. And this is impossible as long as there exists a division of functions among our services which is growing increasingly arbitrary. A strategy utilizing missiles is not necessarily analogous to air strategy because missiles fly through the air, any more than a 1,500-mile missile is a tactical weapon because it is fired like an artillery projectile.

It may well be that the separation of the Army and the Air Force in 1948 occurred two decades too late and at the precise moment when the distinction between ground and air strategy was becoming obsolete. Instead of making the Army Air Corps independent, it would probably have been sounder to mix the two organizations more thoroughly. The separation of the two services was achieved to the detriment of both; different service academies, training schools, and war colleges inevitably emphasize a particular aspect of strategy instead of an over-all doctrine in which traditional distinctions should be disappearing, in which the Army should begin to approach the mobility of the Air Force and the Air Force to develop the relative discrimination of ground warfare.

It would still be the wisest course to move in the direction of a single service initially by amalgamating the Army and the Air Force. The strategic problems of the Navy may remain sufficiently distinct not to require integration, and in any case resistance to complete unification in the Navy would be so bitter as to obviate its advantages. A unified service with a single system of service schools would force officers at a formative stage of their careers into a framework less narrowly addressed to the concerns of a particular service.

Complete unification among the services is probably out of the question. The persistence of bureaucratic forms and the traditions from which each service derives its strength would insure overwhelming resistance to the concept of a single uniform and a single system of service schools. It may even be that a single service would be too unwieldly and would still require a subdivision according to the strategic tasks which have to be performed. It may, therefore, be best to begin reorganization by creating two basic commands, each representing a clearly distinguishable strategic mission. The Army, Navy, and Air Force would continue as administrative and training units, much as the training commands *within* the various services function today. But for all other purposes two basic organizations would be created: the Strategic Force and the Tactical Force. The Strategic Force would be the units required for all-out war; it would include the Strategic Air Command; the Air Defense Command; those units of the Army required to protect overseas bases; and the units of the Navy which are to participate in the retaliatory attack. The Tactical Forces would be the Army, Air Force, and Navy units required for limited war. The Strategic Forces would probably be under Air Force command, the Tactical Forces under an Army officer. The training and doctrine of each Force should be uniform and its officers should attend the same technical and service schools. The schools would continue to be administered by a parent service, but the curriculum and student body should be determined by the Force commander.

Such a division would reflect the realities of the strategic situation. While the Tactical Forces might be required in an all-out war and for such a purpose would come under the command of the Strategic Forces, the Strategic Forces should not be utilized for limited war and should be as self-contained as possible even for all-out war. The strategic striking force is the chief deterrent against all-out war; it must therefore be reserved for this contingency. This is particularly important during a limited war, because to the extent that our retaliatory force was expended in such a conflict, the enemy would lose his incentive for keeping the war limited. An aggressor who would tempt us to utilize our strategic striking force for limited war would gain a strategic advantage, however military operations ended. For to the extent that our retaliatory force suffered attrition in a limited war, our ability to deter the enemy from all-out war would be reduced—and thereby the sanction for keeping the war limited. To consider our strategic striking force as a dual-purpose force will weaken the deterrent to all-out war precisely when it should be strongest.

Moreover, the nature of the weapons, the planning, and the concept of operations differ radically between forces useful for all-out war and those which should be ready for limited war. The weapon systems for a limited war, on the other hand, should be flexible and discriminating. In an all-out war the targets are known in advance; in fact each crew of the Strategic Air Command is training for a specific Soviet target all the time. Everything depends, therefore, on the efficiency with which the plan for all-out war can be implemented. In a limited war neither the locale of the conflict nor the targets can be determined in advance. Everything here depends on the rapidity with which planning can adjust to a developing situation.

The strategic problem in limited war is to apply graduated amounts of destruction for limited objectives and also to permit the necessary breathing spaces for political contracts. Hence a weapon system for limited war is basically different from a retaliatory force. Limited wars require units of high mobility and considerable firepower which can be quickly moved to trouble spots and which can bring their power to bear with discrimination. The capability for rapid deployment is crucial. For given the power of modern weapons and the speed of movement of military units everything depends on seizing a position as rapidly as possible because it will be very difficult to dis-

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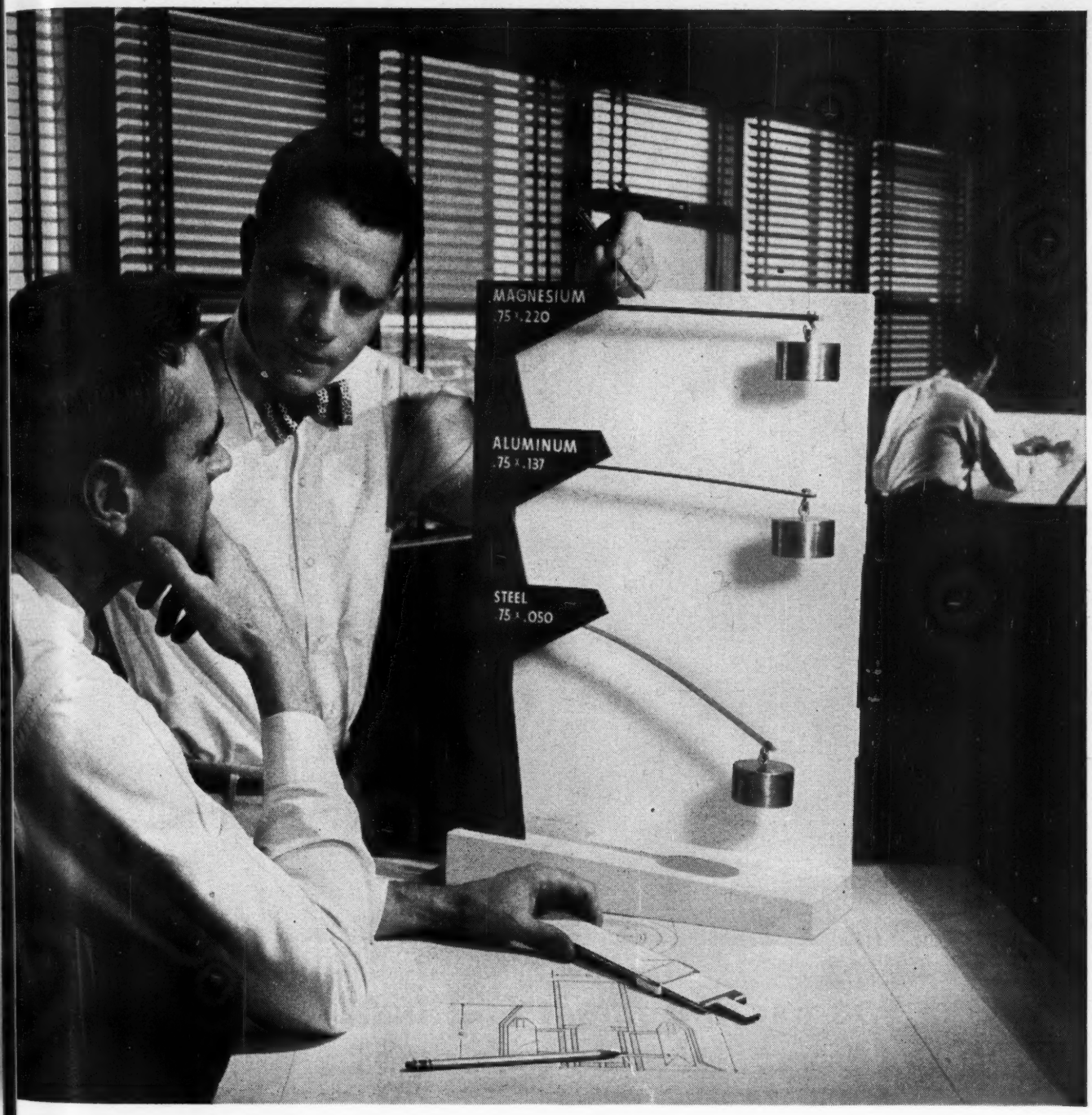

Rigidity! At equal weight, magnesium is 18 times stiffer than steel

Magnesium's unique combination of strength and light weight gives it some outstanding abilities as a structural metal. Take rigidity, for example. A magnesium bar has 22% the stiffness of a steel bar of the same dimensions.

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lodge an enemy once he has become established. Since aggression is unlikely to occur unless the aggressor doubts either the capability or the willingness of its opponent to intervene, the ability to get into position rapidly even with relatively small forces can serve as a gauge of the determination to resist and contribute to the reestablishment of an equilibrium before either side becomes too heavily committed.

The division of our forces into a Strategic and a Tactical Force would reflect the real nature of the strategic problem we confront: the necessity of being protected against all-out war as the prerequisite of all other measures and the capability to fight limited war as the form of conflict where the cost is commensurate with the issues actually under dispute.

In such an organization, too, the Joint Chiefs of Staff would change their character. They would be composed of a Chairman, the Chief of the Tactical Forces, the Chief of the Strategic Forces, the Chief of Naval Operations (to represent operations such as anti-submarine warfare which do not fit into any of the above categories). Such a group would in its very nature be more oriented toward doctrine than the present Joint Chiefs of Staff. The Chief of each Force would represent an integrated strategic mission and not a means of locomotion. Since service chiefs would continue to administer the traditional services, the Chief of each Force would be freed of many of the routine problems of administration which, as Adm. Arthur Radford pointed out before the Symington Subcommittee, make the Chairman the only member of the present group who can give his full attention to problems of over-all strategy.

The advantage of the proposed organization for the conduct of military operations is demonstrated by the fact that joint commands reflecting the same basic concept have been set up in every recent war in which we have been engaged. The new organization would create in peacetime the structure which the requirements of combat would impose on us in any case. To be sure, there would be a possibility of the same contest over appropriations as now between the Chiefs of the Strategic and the Tactical Force. And there would be the same temptation to invent doctrine to support budgetary requests. But with each Force representing a distinguishable strategic mission, self-interest and requirements of strategic doctrine would be in harmony.

In attempting to channel military thought toward doctrine, it would be desirable, however, to relieve some of the pressure inherent in the almost incessant process of either preparing, negotiating, or justifying budgets. A great deal would be gained by an extension of the budget cycle for defense appropriations to a period of two years. Thus the military budget would coincide with the term of the House of Representatives. And, as we have seen, many of the essential commitments for major procurement of necessity extend over several years.

To be sure, in its initial stages such a procedure might sharpen interservice rivalries because commitments would now be more fundamental. But bringing the interservice disputes to a head would produce healthy consequences in the long run. The failure to resolve current doctrinal disagreements and the pretense of harmony at each budgetary hearing cause the conflict to rage by subterfuge, by planned leaks to newspapers or to Congressmen. A two-year budgetary cycle would free the service chiefs from the constant pressure of short-term considerations; it might encourage planning to turn from the essentially defensive task of justifying force levels to the consideration of the purpose of those forces.

With the emergence of an agreed strategic doctrine within the Department of Defense, the whole process of formulating security objectives within the Executive Branch would gain in balance. An explicit Department of Defense position would then confront the fiscal position. With a better structure for producing strategic decisions and a longer interval between budget hearings (the latter, though helpful, is not essential), interservice disputes would lose a great deal of their intensity. Doctrine could then be built on the only sound basis: a concept of the nature and the possible goals of war.

POWER NO SUBSTITUTE FOR DOCTRINE

In the absence of a generally understood doctrine, our actions will of necessity prove haphazard; conflicting proposals will compete with each other without an effective basis for their resolution. Each problem, as it arises, will seem novel and energies will be absorbed in analyzing its nature rather than in seeking solutions. Our services will find it impossible to make a meaningful choice among the mass of new weapons with which their research and

(Continued on page 85)

Operations Officer

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The image orthicon may not be pictured for reasons of security. However, the monitor on which the picture is displayed is commercially available. Designed for the Armed Forces, it is a unit of unsurpassed quality offering superb resolution, extremely good linearity and such unusual features as control of size independent of linearity and the ability to reverse the phase of the signal. Write for detailed description and price.

The human eye is a remarkably sensitive instrument. But it is no match for the image orthicon TV camera developed by Admiral for the Armed Forces. Light from an ordinary match reveals as much to this TV camera as a man with 20/20 vision sees in the light of a 150 watt bulb. Obviously, the armed services will find countless ways to use this sharp-eyed observer for reconnaissance under adverse conditions.

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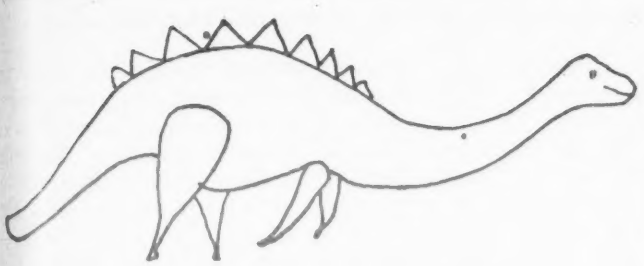
STRATEGY AND ORGANIZATION—CONTINUED

development programs will soon overwhelm them. We will continue to cede the initiative to others and our course will become increasingly defensive.

Many of our problems in the post-war period have been produced by our failure to accept the doctrinal challenge. We have tended to ascribe our standards of reasonable behavior to the Soviet leaders; we have had difficulty in defining our purposes in relation to the revolutionary forces loose in the world. Above all, we have had a penchant for considering our problems as primarily technical and to confuse strategy with the maximum development of power.

One of the paradoxical lessons of the nuclear age is that at the moment when we are acquiring an unparalleled command over nature, we are forced to realize as never before that the problems of survival will have to be solved above all in the minds of men. In this task the fate of the mammoth and the dinosaur may serve as a warning that brute strength does not always supply the mechanism in the struggle for survival.—END



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Applicants must possess capacity for relating logistics experience to the prediction of future weapon systems requirements. Strong motivation for team participation with diversified operations and engineering personnel is essential.

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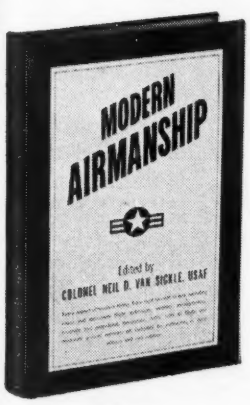

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THE AF'S RECRUITER-SALESMEN

The Men Who Sign 'em Up

By Flint O. DuPre

AF recruiter-salesmen spend a lot of time on the phone, must know the answers.

ALMOST three years ago the Air Force assumed responsibility for its own recruiting.

Today Air Force recruiters—more properly known by the name "recruiter-salesmen"—must be able to talk intelligently about the opportunities of such varied Air Force careers as communications, jet engine maintenance, missiles and rockets, weather, armament, firefighting, electronics, food service, finance, and dozens of others. But even more important, they're talking about the Air Force, the world's largest business, and its basic "product"—national security and preparedness. The responses are varied but mostly favorable, as the records will show.

Recruiters, especially those in metropolitan areas, operate out of offices that are easily accessible to the public. Such an office is located in historic Alexandria, Va., just across the Potomac from Washington, D. C. Here are headquarters for the 206th Detachment of the 3502d USAF Recruiting Group. This detachment regularly exceeds its quota and topped all others in the AF the first six months of FY '57.

A recruiting sales supervisor, M/Sgt. George W. Bailey, Jr., of Petersburg, Va., is on duty in the office when a husky high school football hero from a small school in the hill country of Virginia walks in. Let's call him Sam. He is typical of the hundreds of seventeen- to nineteen-year-old youths who take a similar step each day.

Sam has come to the recruiting office for any one of a number of reasons. He may have received a phone call or a letter from the office inviting him to drop by for a visit. Or he may have been motivated by Air Force recruiting publicity that saturates his home town. Or his parents or one of his buddies may have influenced him, or his high school coach may have told him he thought the Air Force to be a good bet. Even the mail man or the milk man may have put in a good word for the Air Force, for the recruiting-salesmen know that such men see and talk with youths in their neighborhoods almost daily.

But whatever the reason, Sam now sits across the desk from Sergeant Bailey. Their visit will last from an hour to an hour and a half. Sam will be encouraged to do much of the talking as Sergeant Bailey evaluates him carefully for a four-year enlistment in the Air Force.

Then Sergeant Bailey tells Sam the Air Force story. It's no canned "pitch." It's different with each prospect. Sergeant Bailey judges character as he moves along. He talks casually, avoiding high-pressure phrases and mannerisms. The sergeant knows his subject well for he has been in the Air Force almost seventeen years, with service in Europe during World War II and later in Korea. He tells Sam what the Air Force can mean to him, now and in the future. He keeps a visual recruiter guide handy—an illustrated booklet that shows the pay scales, travel and job opportunities, security programs, and other aspects of Air Force life.

Seattle recruiter, T/Sgt. Burdell Aherns, signs up Harold D. Johnson after fourteen years of Navy service.

Sam seems interested, so Sergeant Bailey gives him a simple preliminary test—an enlistment screening test—consisting of questions on mathematics, word meanings, and picture puzzles. A more exacting aptitude test will be given Sam after he starts his recruit training.

Sam decides the Air Force is for him. He signs the papers and is sworn in for a four-year enlistment. In a few days he will be on his way to recruit training at an Air Force base.

In their day-to-day life, Sergeant Bailey and the AF's other recruiters become part of the community to which they're assigned. The practice of good community relations has paid off handsomely for several outstanding recruiters. M/Sgt. Robert F. Anderson, of Detachment 610, Phoenix, Ariz., not long ago became the first active-duty airman to head a Kiwanian organization. He was installed as President of the Mesa (Arizona) Kiwanis Club. Sergeant Anderson's community relations activities are endless. They include the Mesa YMCA, Civil Air Patrol Squadron which he helped organize, National Newspaper Day, "Get Out and Vote" Battalion, National Kids Day, Arizona Boys Ranch, and a Mesa High School Flight.

(Continued on page 89)

New Cessna YH-41

"delivers" top performance

plus big maintenance savings

to helicopter flying!

Cessna's all-new YH-41, recently purchased by the U. S. Army for its air "arm," combines the latest in design and engineering advances to give operating and maintenance performance never before experienced in the helicopter field!

For example, the engine—mounted in the nose of the fuselage—makes installation and servicing easy, provides extra cargo or passenger space. Cessna has made the rotor assembly aerodynamically clean. Also, the drive system on the new YH-41 is a masterpiece of simplicity, has a minimum of parts—conveniently located for easy servicing.

Cessna

Offering multi-utility uses, the 4-place YH-41, at 3,000 lbs. gross weight, can climb higher, faster than any other helicopter in its class—sea level to 10,000 ft. in less than 12 minutes! Its speed is the fastest in the light helicopter field.

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At Curtiss-Wright's Turbomotor Division—which has augmented operations with new modern facilities at Princeton, New Jersey—engineers are expanding the potentials of turbo power, developing engines for both aircraft and non-aircraft uses. Their answers are contributing to the overall advancement of the science of propulsion . . . continuing Curtiss-Wright's leadership in every major airpower category of today and of the future.

TURBOMOTOR DIVISION
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Another one-man community relations firm is M/Sgt. Antonio Junco in the Beckley, W. Va., area. Averaging twenty-five enlistments per month, Sergeant Junco takes part in most of the community activities—especially sports—and helps out in all youth activities. His formula for success: Study the area, get to know the likes and dislikes of the people, know your prospective enlistees by first name if possible, and stay on the job around the clock. Sergeant Junco was the AF's top recruiter in 1955 and last year was Air Training Command's "Airman of the Year" at the Air Force Association's convention in New Orleans.

Since enlisting and keeping good personnel continues to be the Air Force's principal problem, recruiting is a serious business. But there is some fun in it, and even romance.

Dan Cupid pulled his bow on one applicant. When a pretty brunette named Jean Howard turned up at S/Sgt. Berton Cogdill's desk in Greenville, N. C., the AF recruiter had a tussle between duty and his own desires. He was duty-bound to do everything he could to enlist the pretty girl into the WAF. But when he took a good look at her face and figure, he flipped. His quota suffered a temporary loss, but, he says, all wasn't entirely lost, for, as he puts it, "The Air Force gained a very understanding service wife."

Air Force recruiting will be three years old in July. Its inception came when the Air Force faced the problem of personnel retention in the jet-atomic age and gained separate responsibility for recruiting. The 3500th USAF Recruiting Wing, with headquarters at Wright-Patterson AFB, Ohio, was activated in July 1954. Its first commander, Brig. Gen. Arno H. Luehman, had been Deputy Director of Public Information at HQ., USAF, before taking on the recruiting job. Next month General Luehman will leave the 3500th Wing and return to Washington, D. C., where he will replace Brig. Gen. Andrew J. Kinney as Director of Information Services, Hq., USAF. And the AF's top recruiting slot will be filled by Brig. Gen. Elvin S. Ligon, Jr., who will take over at Wright-Patterson AFB.

For recruiting, the US is divided into six geographical areas, with sixty recruiting detachments in the large cities and USAF recruiting stations in the smaller communities.

Recruiters are trained at Lackland AFB, Tex., where the recruiting course emphasizes career benefits and counseling, selection criteria, processing, administration and training, information services and community relations, public speaking, and salesmanship.

Good community relations has been the watchword with M/Sgt. Bob Anderson, in Mesa, Ariz., here with family: Bruce, 8; his wife Grace, and Bob, Jr., 14.

Recruiting salesmen work on established quotas. The wing has a monthly quota to meet, figured up or down from a 16,000-a-month requirement. During its existence the wing has signed up about 450,000 Air Force applicants.

An old-time line sergeant summed it up when a recruiter, T/Sgt. Robert L. Marshall, signed up his brother, Kenneth, for a four-year enlistment. "Boy, we've got it when we can sell it to our own kin," he said.—END

Brig. Gen. Arno H. Luehman, first commander of the 3500th Recruiting Wing.

Keeping it in the family. At Lincoln Park, Mich., recruiter-salesman T/Sgt. Robert L. Marshall signs up his brother for a four-year hitch in the Air Force. Kenneth Marshall become the 9,000th AF enlistee from Michigan since July '54.

The READY ROOM

RESERVE AND AIR GUARD NEWS

The face of the Air National Guard is undergoing a **major change.** Between now and July 1, 1958, **forty-four squadrons**—or more than half of the tactical fighter organizations—will convert to **more modern and higher performance jet aircraft.**

Going out of the program are the old F-80s, RF-80s, F-84s, B-26s, and early model F-94s. Coming into the program are the **Republic F-84F and RF-84F, North American F-86D, and late model Northrop F-89 and Lockheed F-94 aircraft.** When the conversion is completed, the two basic aircraft in the Guard program will be the **F-84F and F-86D.**

The conversion will not be accomplished without finding solutions to numerous problems. **One immediate problem is money.**

Twenty-seven squadrons were ordered converted after the budget for fiscal 1958 was prepared. And the conversion program is costly. It has been estimated that the Guard will need as much as **$31 million** more than is provided for in the budget now before Congress to support the modernizing program in the next year.

In the light of **current economy moves** in Congress, there seems **little likelihood** that such an increase will be made in the Air Guard budget. Therefore, funding for the conversion program in the next year will have to be accomplished **by diverting money** from other projects in the Guard program.

Another serious problem will be encountered in the area of **support equipment.** Normally, the **Air Force** turns over aircraft it no longer will use. This makes available ground-handling equipment and materiel back-up. The **situation is different this year.** Air Force will continue to operate aircraft **similar to those** being phased into the Guard inventory, and therefore **will not be able** to turn over all the materiel support equipment the Guard will need.

A **third problem** exists in the **pilot area.** Air Force has notified the Guard that it no longer can give ANG pilot trainees **advanced combat crew training.** If the decision sticks, it will mean that **gunnery** and **other advanced phases** of combat tactics must be taught **in the home squadrons.** Converting young pilots into high-performance aircraft and, at the same time, requiring that they take combat crew training with a minimum of flying time in these aircraft **has the Bureau worried.** The inevitable result of such a combination, historically, is an **increased accident rate.**

The prospect of more accidents **is particularly discouraging,** according to Bureau spokesmen, because the Guard has **made great strides** in reducing its accident rate. In 1956, for example, the Guard accident rate added up to 30.5 per 100,000 flying hours—or a decrease of approximately thirty percent from 1955.

Still, if the Guard has to provide advanced training at home for new jet pilots, the **warning signals** are up. New aircraft will cost in the neighborhood of $400,000 each—not to mention the inestimable cost of a pilot's life. Therefore, **the Guard hopes** that the Air Force will continue to give the advanced combat crew training.

Maj. Marshall Johnson, right, commander of North Dakota ANG's 119th Air Defense Group, congratulates Lt. R. P. Lucas, radar observer, and Capt. Duane S. Larson of the Group's 178th Fighter Squadron after they had become the first Guard all-weather crew to qualify in rocket firing.

Reservists in Texas have come up with a program which permits tubercular convalescents to fashion useful articles of deer hides. Here, Miss Evelyn Monzingo of KTBC-TV, Austin, and Maj. Charles Brooks, Austin Reserve Center, check load of hides en route to a California tanner.

To be prepared for home station training, the Guard last month played host to an **All-Reserve Forces flying safety conference** at Gulfport, Miss. The **Guard** delivered all wing commanders, all air advisors, and one representative from each tactical squadron. The **Reserve** had wing commanders, Reserve flying center commanders, a representative from each squadron, and representatives from Continental Air Command and the numbered Air Forces on hand. The purpose: **To give officers in charge of training new ideas toward a better combat capability through improved flying safety practices.**

The **final major problem** facing the Guard is that of **ranges for firing rockets.** With the advent of the North American **F-86D,** the late-model Northrop **F-89,** and Lockheed **F-94,** areas must be found to permit rocket-firing for record. Firing for record with rockets involves **complete ground control,** and **ranges larger** than those being used for firing .50-caliber ammunition. The Bureau is currently studying the possibility of expanding Guard ranges or using Air Force-owned ranges.

* * *

The National Guard Bureau has expanded its **air tech-**

(Continued on page 93)

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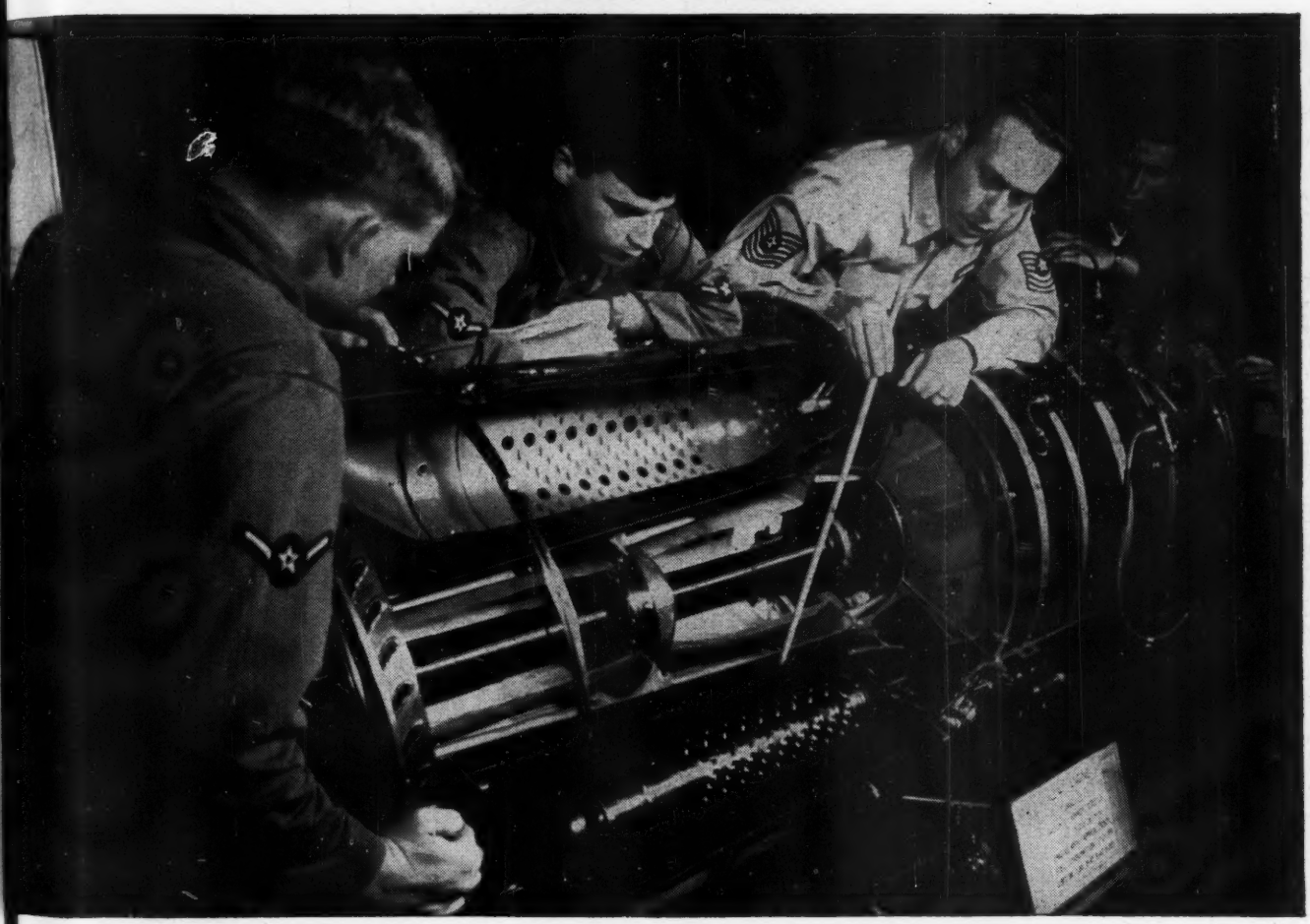

THE U.S. AIR FORCE PRIOR SERVICE PLAN MAKES YOUR EXPERIENCE MORE VALUABLE THAN EVER

Work on a job that offers you real satisfaction, the chance for advancement and future benefits—*back in service.* Under the liberalized Air Force prior service program, a wider range of skills are now accepted, and a broader conversion list matches the experience of men from other services with Air Force skills. You may apply for a paid 30-day delay in reporting, and you will be given your choice of bases where your skill can be utilized. Your local recruiter has all the information for you on pay raises, increased bonuses and allowances, plus extended retirement benefits. See him today, or mail the coupon. Find out about the job waiting for *you.*

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Paste on post card and mail to V-77AF3
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Please send me more information on the Air Force Prior Service Program.

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The reason is RCA's *Ear Protector*, a new and scientific approach to the problem of excessively loud noise. This device dampens out intense and penetrating sounds, permitting you to work comfortably in areas where-in the noise levels might otherwise be prohibitive.

Made of plastic, the Ear Protector surrounds the ear without actually touching it. Contact with the head is by means of a soft, replaceable, liquid-filled cushion that provides a comfortable, self-adjusting seal. It may also be adapted for intercom use, and for any other application where noise can interfere with efficiency.

Light in weight, highly efficient, sanitary, simple and inexpensive, RCA's Ear Protector belongs wherever noise becomes a menace or a nuisance.

Defense Electronic Products

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Admiring ConAC administrative effectiveness award they helped Tenth AF to win for the second straight year are (from left) M/Sgt. Ray Dillman; A/1C William Taylor, Jr.; Reserve Capt. Nathaniel Carr, a Detroit policeman; and Mrs. Harold Russell, the wife of a Detroit AF Reservist.

nician program to include a Base Facility Supervisor at approximately seventy ANG bases.

Maj. Gen. Winston P. Wilson, Chief of the Bureau's Air Force Division, last month told the annual conference of the **Adjutants General Association** in Washington that the new position will be located in the installations section of the detachment headquarters at each base.

The new position will require that the officer be a **super-grade air installations officer.** He will be responsible for operating the utilities systems, fire prevention, crash and rescue services, insect and rodent control, and care of permanently installed equipment.

If these were not sufficient responsibilities, he also will be **held responsible** for developing projects for construction, rehabilitation, modifications, and alterations to the existing base physical plant.

To get the program started in the right direction, General Wilson announced that **quotas for ANG officers** have been established at the **Air Force's Installations Engineering Officers Course** at Wright-Patterson Air Force Base. The course lasts nine weeks.

* * *

North Dakota's 178th Fighter Squadron is the first ANG all-weather outfit to conduct an **air-to-air rocketry exercise,** using the 2.75 FFAR (Mighty Mouse) weapons with which their **F-94C** aircraft are equipped. The crew of **Capt. Duane S. Larson,** pilot, and **Lt. R. P. Lucas,** radar observer, is the first to become fully combat qualified in rocket-firing operated by the Air Guard.

The exercise was conducted **last month at Duluth** and **not without difficulty.** To fire the Mighty Mouse requires a **T-33 tow airplane** with a complicated reel and launching device. In addition, the **DelMar target** is a small, bomb-shaped plastic device which replaces the banner normally used in firing .50-caliber guns. Instead of one gun camera, **three** are carried on each aircraft engaged in firing—one under each wing and one mounted on the radar observer's scope.

These items are **in scarce supply** for issue to ANG units. The 178th was required to **work out their own wing cameras and mounts,** scope recorders and Kluge boxes—all manufactured locally by the North Dakotans. That the equipment worked is borne out by the fact that Larson, who is the squadron commander, and Lucas **qualified on the first mission** of the exercise.

* * *

The Air Force Reserve's **302d Troop Carrier Wing** at Clinton County Airport, Wilmington, Ohio—winner of the **Air Force Association's 1956 award** as the **outstanding Air Reserve unit in the country**—has received another citation.

The wing has been cited by the **58th Air Defense Division** and **Eastern Air Defense Force** for its efforts in flying a total of **fifty-five logistical missions** in support of the air defense division's recent rocketry training program.

The wing, commanded by **Col. B. J. Campbell,** flew **45,240 air miles,** airlifted **646 passengers,** and hauled more than **82,000 pounds of cargo** in supporting the rocketry program.

In a note to **Maj. Gen. Roger J. Browne,** commander of First Air Force of which the 302d is a member unit, **Brig. Gen. Von R. Shores,** division commander, said the logistic support had enabled units of the 58th participating in the exercise to fly 1,169 training sorties and permitted fifty-five pilots to become operationally qualified.

—EDMUND F. HOGAN

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How WHITE ALICE Goes OVER the Hill

By T/Sgt. Ben F. Blackman

ON A bleak, snowy morning in late November, a small group of military personnel and civilians gathered at Elmendorf AFB, near Anchorage, Alaska, for a simple but important ceremony.

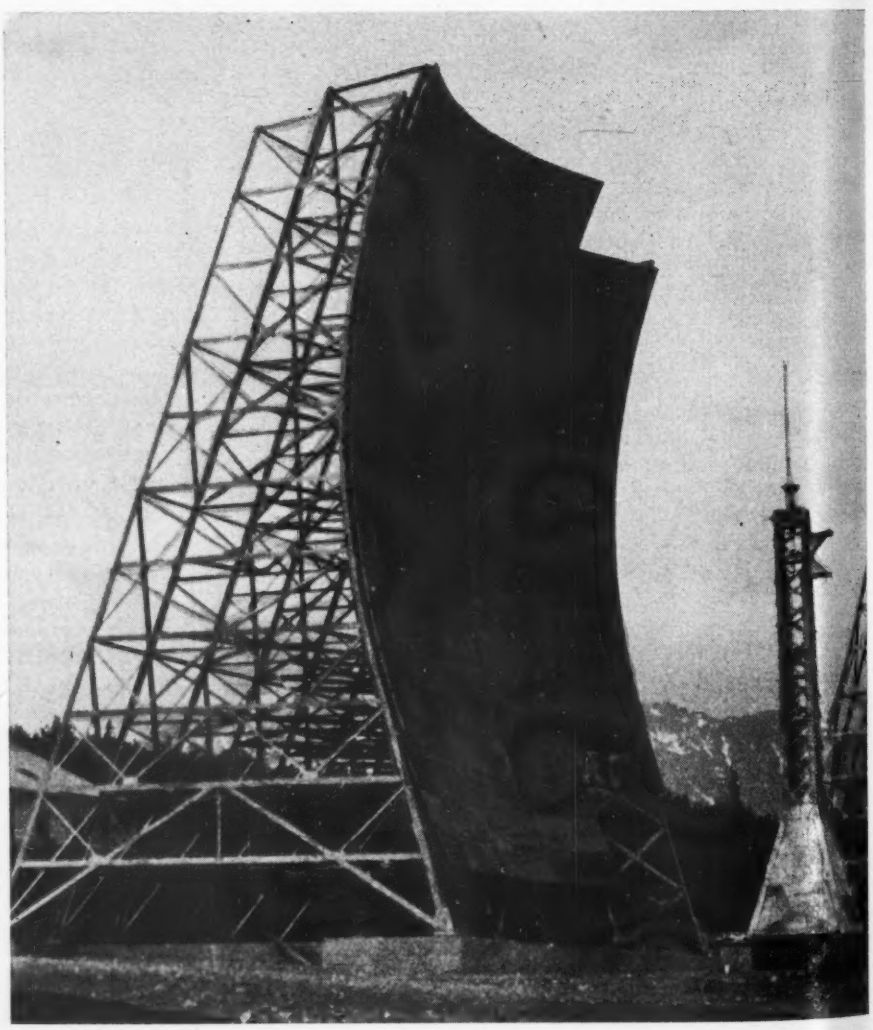
Lt. Gen. Frank A. Armstrong, Jr., USAF, Commander-in-Chief of all military forces in Alaska, broke the hushed tenseness of a smoke-filled room near his headquarters as he picked up a telephone receiver and began talking. His voice carried out over the far reaches of the Gulf of Alaska to Middleton Island, some 200 miles away.

The short conversation placed into operation the first link of a new defense communications network in Alaska known as "White Alice." In effect, the occasion marked the first step of a vastly improved telephone and telegraph hook-up designed to bring all of Alaska's far-flung and otherwise almost inaccessible regions into immediate contact with each other for better defense against an enemy attack from the North.

It also satisfied a long desire by the Air Force to conquer the static-choked atmosphere and savage storms of the polar regions that had played hob with military radio and other communications in past years.

The new system uses two types of radio relay to bridge the Territory's wilderness where the building of wire circuits across frigid wilds and servicing them during extreme weather conditions had been an impossibility.

Most of the "White Alice" locations



Huge scoop-shaped antennas, standing sixty feet high and resembling outdoor movie screens, are the basis for transmitting and receiving in "White Alice."

Here's how "forward propagation tropospheric scatter," or over-the-horizon radio relay, works. Antenna sites are separated by both intervening topography and the earth's curvature. The transmitter beams a radio signal toward the horizon, directly at the receiving station. Most of the signal is lost, but enough of it is deflected down by the troposphere—the layer of air extending about five miles up from the earth's surface—so that a small fraction of the original transmission reaches the receiving station. There it can be amplified and sent on to another receiver. Eight of the thirty-three "White Alice" sites will use line-of-sight microwave radio relay for shorter transmissions.

being built have a relatively new system of ultra-high-frequency radio, technically named "forward propagation tropospheric scatter." This is a network of over-the-horizon type radios, which use huge 100-ton scoop-shaped antennas that stand sixty feet high and look like outdoor movie screens. The principle was developed and first used on a much smaller scale in the Northeast Air Command.

Because the system works in the ultra-high-frequency band, it is undisturbed by Arctic climate, terrain, and those phenomena common to the northern area—the aurora borealis and strange magnetic solar effects.

Transmitting and receiving stations, sometimes 200 miles apart, must be aimed at the horizon in the precise direction of each other. Each unit is so sensitive that being one degree off would make it ineffective.

At the transmitting point, scores of separate messages can be combined into a single signal. This signal is transmitted to a "feeder horn," located on a tower directly in front of the big scoop-shaped antenna. The horn literally sprays the outgoing signal against the curved face of the screen, which beams it out toward the horizon like a huge invisible searchlight. Much of the scatter is lost as it goes out and up, but the troposphere, a layer of air extending about five miles upward from the earth's surface, deflects a tiny amount downward.

When received by another "movie screen" antenna far across the frigid mountains, the signal is only about 1/10,000,000,000,000 of the original scatter emitted by the sending screen. But this minute fraction is enough to do the job. If necessary, it can even be amplified by the first receiving station and forwarded again in a repeat process until it reaches the end of the entire circuit.

Eight of the "White Alice" stations (there will be thirty-three in all) will use microwave radio relay for transmission purposes. This is a line-of-sight system with towers placed about twenty-five miles apart in easy-to-reach locations. This type of network is already used extensively throughout the United States for great volumes of conversations. In some states law enforcement agencies employ its use for instant contact with other agencies.

The entire "White Alice" system, when completed, will provide the Alaskan Air Command with more than 3,100 route miles of vital contacts through a region of paramount importance to our continental defense. It can provide the Air Defense Command and the Strategic Air Command with precious additional minutes if an attack comes.

Bell Telephone Laboratories played a major role in the development of both the microwave and over-the-horizon radio systems and also contributed substantially to the "White Alice" project through special work by its scientific staff and facilities.

Wheels first began to turn on the sprawling network in early 1954, when the Air Force formed the Alaskan Communications Study Group to develop a plan for a much needed integrated defense communications system. The Bell people were asked to recommend a suitable and economical way of creating such a network.

The Air Force spelled out its specifications in precise terms. First, the network had to span long distances across barren reaches of Alaska. It had to function with dependability in Arctic storms and under great atmospheric interference. It had to carry many voices and telegraph channels

(Continued on page 97)

BUAER'S NEW AVIONICS DIVISION MEETS ELECTRONIC WEAPONS NEEDS OF NAVY AIR ARM

U. S. Navy Photo

Brand new in the Navy Bureau of Aeronautics, the Avionics Division is responsible for all aspects of research and development of electronic fire control and weapons launching equipment for Navy aircraft and guided missiles. This Division deals daily with problems undreamed of as recently as World War II. To ensure that our Navy air arm will continue to be the most effective and ultra-modern in the world, it plans in terms of 10, 15, or 25 years hence. Its personnel must think in terms of Mach 10 speeds or altitudes of 20 or more miles.

This vital R & D mission, which was formerly accomplished by the joint efforts of Armament and Electronics Divisions, has been merged in the Avionics Division to include a wide variety of electronic functions. Among these are ground station telemetering and instrumentation; guidance systems; warheads; fusing and launching of guided missiles; fighter attack systems; airborne early warning systems, and many others.

To coordinate the many programs under its jurisdiction, the Division has established a "Project Manager" system of organization. This system provides maximum streamlined operation and facilitates industry contacts as well. The personnel of the Avionics Division thus are enabled to develop with maximum facility the incredible electronic equipment needed by today's and tomorrow's aircraft and missiles. With their special knowledge and far seeing outlook, they will make certain that the new higher speeds, altitudes and ranges of aircraft are utilized to full effectiveness.

◀**FJ-3 Fury goes aloft** from one of the after catapults of the U.S.S. Forrestal. An F2H-3 Banshee is in the foreground. Electronics developed by BuAer's Avionics Division provides planes such as these with their highly effective weapons and control systems.

▲**Engineer at Ford Instrument Company opening salt spray chamber in which equipment for BuAer is being subjected to environmental test.**

This is one of a series of ads on the technical activities of the Department of Defense.

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simultaneously. In a nutshell—voice quality had to be as clear as a Bell telephone in any home in the United States.

After a period of study, during which the Bell engineers were aided by the Alaskan Air Command study group, it seemed certain that the answer to USAF requirements for "White Alice" was forward propagation tropospheric scatter. But it had never before been attempted on such a large scale and would have to be specially tailored to Alaska.

Following a long-lines survey, the Western Electric Company was given a letter contract, authorizing them to begin work on the new system. Briefly, the project consisted of engineering, manufacturing, constructing, and installing all elements of the network.

Western Electric was perhaps the best qualified organization in the nation to construct an intricate communications system almost from scatch. In the first place, they were no strangers to the frozen North. They were already prime contractors in building the DEW Line for the Defense Department; and they had built radiotelephone facilities connecting Anchorage, Alaska, and Seattle, Wash., in 1941. During World War II, Western and the Army teamed up to install telephone lines along the Alcan Highway, and later the company built wire circuits from Anchorage to Fairbanks.

Besides experience, Western's chief resource for the "White Alice" project was highly skilled manpower. It could draw on the talents and brains of the entire Bell System. This it did.

The first "task force" of top-notch scientists and selected workers from the far-flung operating companies set out in deep snows from Anchorage in early 1955 to pick suitable sites and conduct radio "path tests" to be sure they were satisfactory. Destinations were reached by dog-sled, tractor, helicopter, and just plain shoe leather.

After six months of battling Alaska's roughest terrain, Western was given the green light to build "White Alice," and bids were opened to several contractors considered capable of handling such a widely scattered construction program.

Morrison-Knudsen, a company which also had long experience in the wilds of the northern frontier, gained the subcontract and in July 1955 began moving men and heavy equipment toward the selected sites.

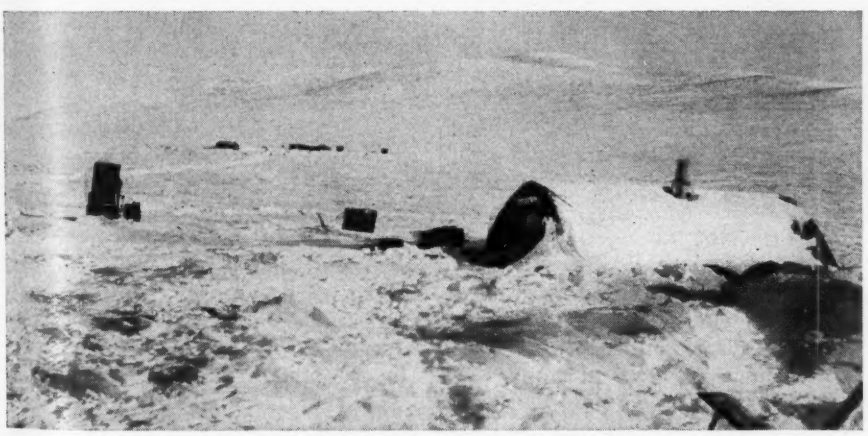
At many spots surveys showed the topographical maps of Alaska from which the project maps had been prepared contained substantial errors. New maps were drawn, and if proposed sites failed to measure up, new locations were picked. Trips to mountain tops through clutching snow and howling winds were repeated—and repeated.

After these surveys proved out, tons of equipment were hauled in for testing radio signals through the ether. Fourteen tons were required to erect one fifty-foot tower at each site and conduct the necessary transmission tests. Every means of transportation available in the Territory was employed to get the material through heavily wooded areas and up hill or mountain during the worst of the 1955-56 winter season in Alaska.

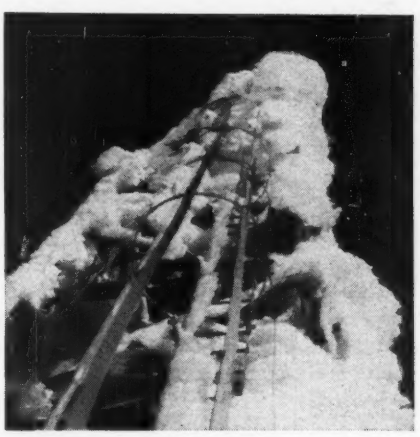
The airlift was common. Techniques previously proven by the Air Force were used at every turn. Skilled bush pilots and Air Force crews made hazardous landings on treacherous streaks of snow with each approach being a touch-and-go adventure, even for the veteran flyers of the bush country. Some locations were so inaccessible that equipment was lifted bit by bit

(Continued on following page)

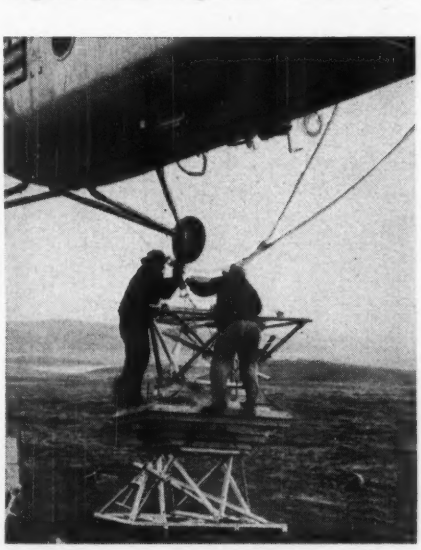
Alaska isn't all ice and snow. Engineers take advantage of warm weather to blaze their way to a possible site.



Snow-buried camp of Western Electric testing crew offers mute evidence of difficulties technicians met in surveying "White Alice" antenna locations.



Severe icing was one of many problems engineers had to fight on "White Alice."



AF helicopter eases down to make the final delivery of a tower's framework.

Tons of equipment were airlifted by small helicopter from the barges to a remote hilltop for a radio relay antenna.

directly from barges on the coast and transported to hilltops by helicopter. Even snow vehicles and dog teams supplemented the more common modes of moving supplies.

Before the winter was out, crews suffered setback after setback. Schedules were lagging. Ice, snow, and winds waged a battle against the movement of supplies necessary to keep "White Alice" going. Eager men stood helpless as savage winds ripped down two of their test towers, twisting the steel beyond repair. But stubborn as Alaska's winter was, the construction crews were even more stubborn. Two or three teams stayed in the field all winter to try to keep the urgent project moving and to repair equipment for the coming spring.

Soon after winter loosened its grip, roads and landing strips were gouged out of the rugged terrain. Temporary huts were torn down as permanent buildings took shape.

At the same time, huge stocks of material began to move again from the big warehouses at Anchorage. Complex electronics apparatus and massive structural steel assemblies flowed northward from the US by ship and plane.

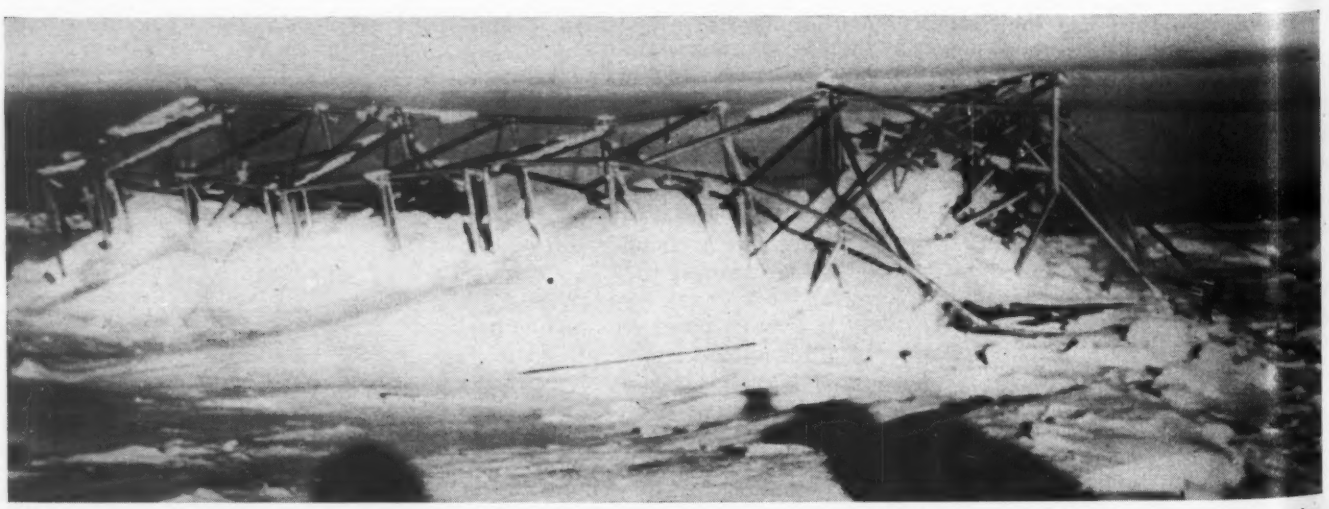
New towers began to peer above the still snow-capped hills, and the scoop-shaped antennas shadowed the tree-lined slopes. Powerful oil-fired heaters were installed inside the enclosed framework of the big radar screens as part of a de-icing system to protect the structures against the most threatening conditions. They will be controlled remotely from equipment buildings some distance away.

The rough groundwork for the entire "White Alice" system now stands behind some 3,000 military and civilian personnel who have had a hand in the construction phase of the operation. There is still plenty to be done, for "White Alice" has just begun to talk. But her voice will grow stronger in the months to come, reaching farther and farther across Alaska.

For those who are still building "White Alice," progress is rewarding; for the families of thirteen who have died in her cause (seven Air Force, three from Western Electric, and three from Morrison-Knudsen), "White Alice" means heartbreak. But all are heroes. They pioneered new paths of communications. They made "White Alice" talk!—END

ABOUT THE AUTHOR

Ben Blackman has written one other recent article for us—"Alaska's Texas Tower," which appeared in the March '57 issue of AIR FORCE. *Back in our January '51 issue he was the author of "One Way Out," written in his capacity as a FEAF combat correspondent. He's served as editor of* Stars and Stripes *in Japan, is now stationed in Anchorage.*



Engineers were helpless when strong winds backed up by snow and ice combined to topple steel tower at testing site.

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American Airlines has used the Bendix Ignition Analyzer for quite some time. The decision to prepare the entire fleet of aircraft for use with this analyzer was made after long usage had shown this to be the most suitable equipment for American's requirements.

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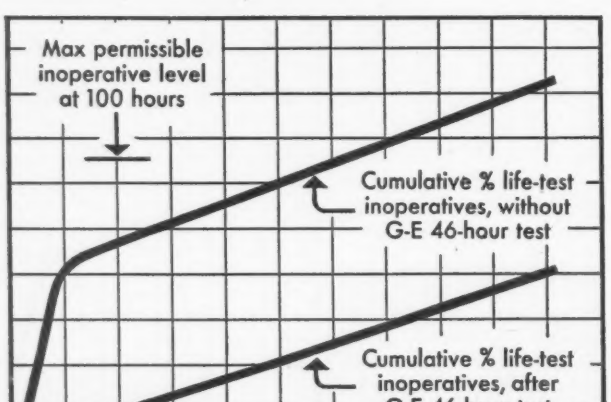
General Electric technician checks 5-Star Tubes on special 46-hour inoperative control test, designed to reduce early-life failures. His lint-free, white Nylon garb marks this process as part of Operation Snow White—General Electric's all-out program to exclude from 5-Star Tubes any impurities that can cause short circuits or impair electrical efficiency.

Special G-E 46-hour inoperative control cuts 5-Star Tube failure rate, assures top dependability!

To weed out early-life failures, General Electric operates *all* 5-Star Tubes for 46 hours *prior to* final life testing and shipment. This special G-E procedure joins with impurity-free Snow White tube production to increase reliability and assure full service life. Benefits of General Electric's 46-hour inoperative control procedure are seen clearly from the life-test chart that follows.



Note that the inoperatives in any lot of 5-Star Tubes on life test are only half as many, at 500 hours, as they would be without G-E inoperative control. Furthermore, at 500 hours, the percentage of inoperatives is still far below the permissible figure established for 100 hours.

46-hour inoperative control procedure helps make General Electric 5-Star Tubes the most reliable you can install. Added to special rugged design, Snow White cleanliness in manufacture, and rigid, extensive tests, this special G-E procedure further minimizes tube failure possibility and safeguards electrical performance.

Specify G-E high-reliability 5-Star Tubes when ordering new military electronic equipment! Use them as replacements! *Electronic Components Division, General Electric Company, Schenectady 5, N. Y.*

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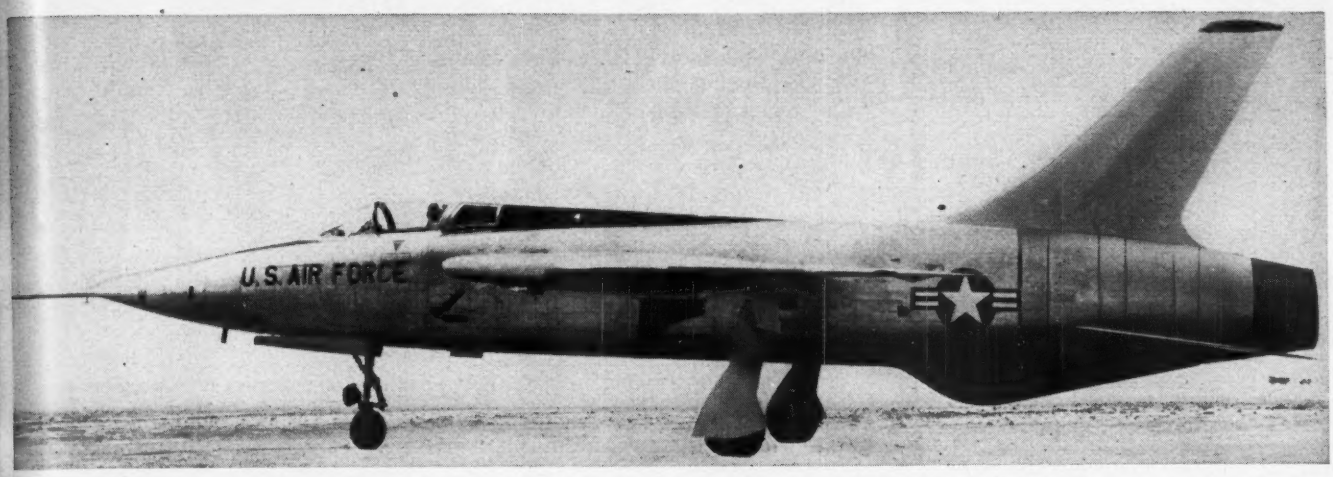
164-1A2

Tech Talk

By Bob Strobell

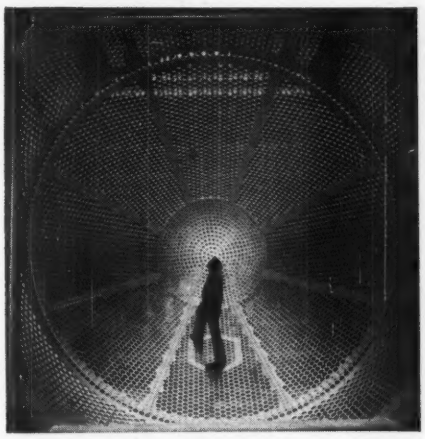


First photograph of Republic's F-105 Thunderchief, a nuclear bomb-carrying fighter which is now ready for production.

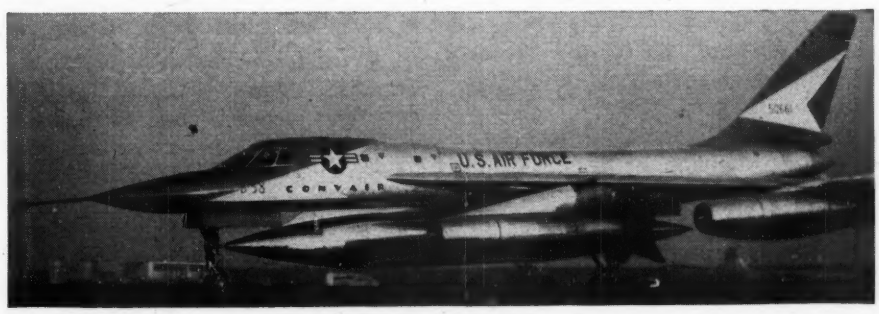
The first photograph of **Republic's F-105 Thunderchief** was released *(see cut)*, shortly after the Defense Department announced that the fighter-bomber had been selected **for volume production.** Designed under the **weapon-system concept** as a **nuclear bomb-carrying fighter** and powered by **Pratt & Whitney's J-75 engine,** the Thunderchief has already proved itself in more than 250 test flights. It flew **faster than sound** on its first flight. The photo has been retouched by the Air Force, notably in the tail section, to obscure details of the empennage still classified as secret. It shows, however, such design features as the **long cylindrical fuselage,** the short, **thin sweptback wings, needle nose,** and the **ventral fin** on the bottom of the fuselage near the tail.

Convair and the USAF have jointly disclosed that the **Convair B-58 Hustler** will carry a **detachable "pod"** slung under its narrow fuselage. Photographs of the supersonic bomber were released following the first flight of the B-58 with its pod attached *(see cut)*. The bomber's **elongated landing gear** keeps the bomber with its pod well above the runway for taxiing and take-off. Carrying such capsules, the B-58 can perform a **variety of missions,** making it a versatile weapon system. Powered by **four General Electric J-79** jet engines with afterburners, the B-58 carries a **three-man crew.** It is about ninety-five feet long and has a wing span of approximately fifty-five feet. The Hustler can operate at altitudes **above 50,000 feet.**

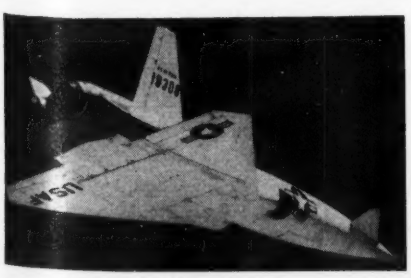
Flight testing of **North American Aviation's X-10** *(see cut)*, an unmanned test vehicle for the Air Force **SM-64 Navaho** intercontinental strategic guided missile program, has been concluded. The missile has been successfully flown **at supersonic speeds** in a series of tests that are a part of the over-all Navaho program, with the purpose of proving out the missile's **aerodynamic design,** as well as **its guidance and control systems.** Powered by **two turbojet engines,** the test vehicle is **equipped with landing gear** so it can be recovered for repeated use. The final test was made at the USAF Missile Test Center, Fla. With data accumulated from this program, **North American's Autonetics Division** will design and manufacture the guidance and control systems for the Navaho. **Rocketdyne,** another division of the company, will build rocket engines to boost the Navaho to flying speed where **ramjet engines** will take over propulsion of the missile on its long-range flight.



Screen in North American Aviation's new Trisonic Wind Tunnel is shaped like a giant colander. The screen diffuses air flowing into the muffler building, protecting soundproofing materials from sudden damaging shock.



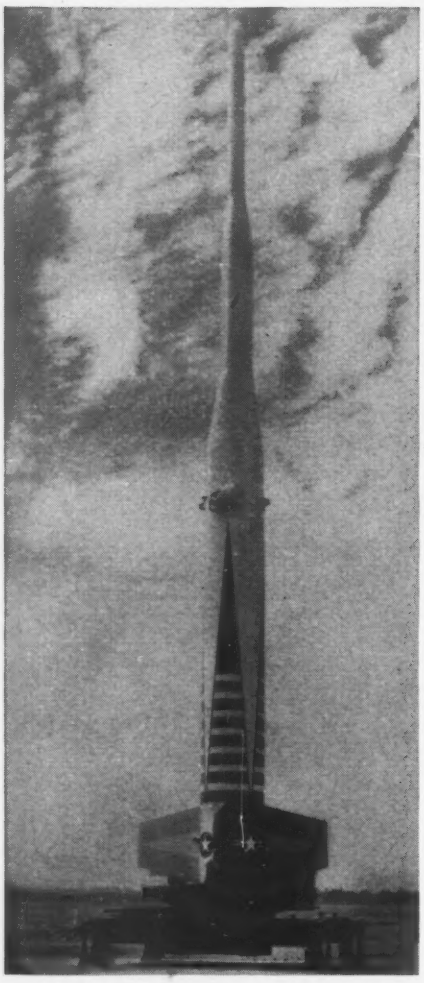
First view of the Convair B-58 Hustler with its detachable "pod," carried under the fuselage. The capsule permits B-58 to perform a variety of missions.



Unmanned X-10 test vehicle is used to test guidance and control systems for North American's SM-64 Navaho.

Some details of the **Lockheed X-17 test missile** were revealed by **Maj.**

(Continued on following page)

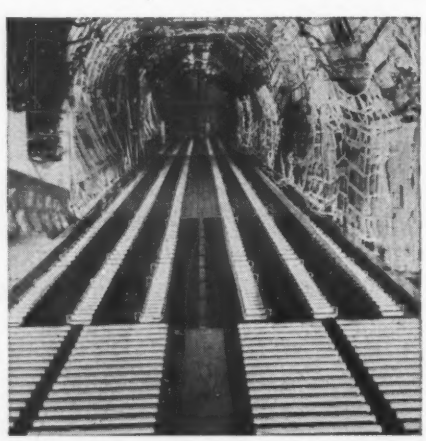


Lockheed's X-17 test rocket provides data on ballistic missile problems.

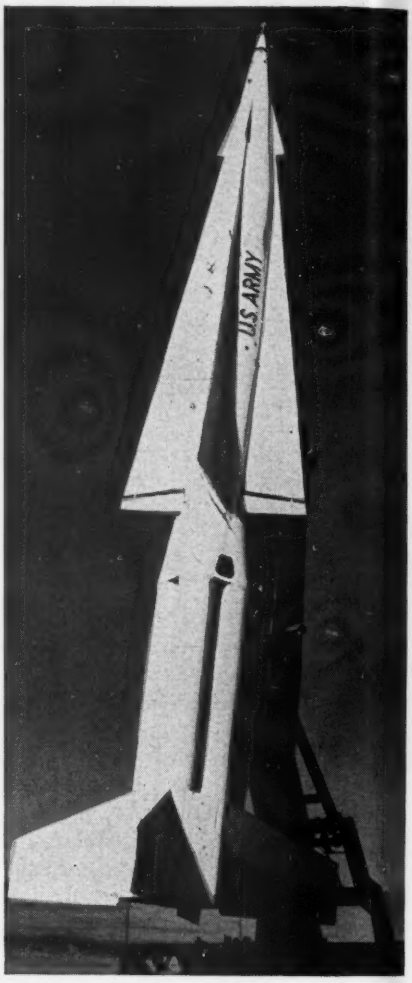
Gen. Bernard A. Schriever, head of ARDC's Western Development Division, in a speech before the **Institute of the Aeronautical Sciences.** The X-17 *(see cut)* is designed to provide information on the problems that arise when **the warhead** of a ballistic missile **re-enters the earth's atmosphere** at high speed. A **three-stage** ballistic rocket, weighing more than six tons, the X-17 stands as high as a four-story building. In the X-17 test program at Patrick AFB, Fla., the test missile hurtles out through the earth's atmosphere at speeds far greater than that of sound. Seconds after it is fired, the missile pierces the **ionosphere**—the layer of very thin air starting some fifty miles above the earth and extending to about 250 miles. It then plunges at tremendous speeds from the ionosphere back into the earth's heavy blanket of air, **transmitting data on aerodynamic heating and stresses.** General Schriever pointed out that the missile costs **only a fraction as much** as a guided missile, since it is especially designed to combine high performance with low cost.

A light that will glow in the dark for more than five years has been adapted by the Surgeon's Office, **Air Materiel Command,** for illuminating **entrance and escape hatch door handles** on Boeing B-52 bombers. The light source is a small piece of **strontium-90,** a specially treated metal which is safe-sealed in a transparent plastic button. It **glows continuously** and in the event of a night emergency where power failure is involved, the synthetic "lightning bug" would guide crewmen to escape hatches. The AMC Surgeon's Office has been licensed by the **Atomic Energy Commission** to handle the self-illuminating button, but distribution will not be made until testing and accountability procedures have been set by AMC.

The Air Force has commissioned a revolutionary **approach-lighting system** whose lightning-like flashes aid all-weather operation of SAC's huge jet bombers at March AFB, Calif. The lighting installation was developed by **Sylvania Electric Products, Inc.,** especially for operation of such aircraft as the eight-jet Boeing B-52 Stratofortress and other high-performance aircraft with high landing speeds. Brilliant, **fog-piercing lights** form the heart of the Sylvania system, known as EFAS (**Electronic Flash Approach System**). These high-intensity center-line lights provide early identification for incoming planes by **flashing swiftly in sequence** toward the runway **from nearly 3,000 feet out.** Beams of **thirty-million candlepower** are emitted in sequence twice a second by each of the system's twenty-three evenly spaced lights. The effect is like **giant tracer shells** traveling at **3,600 miles per hour** toward the center of the safe landing area.



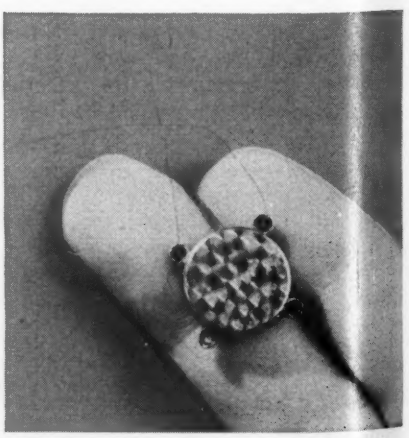
Douglas C-133A has roller conveyors installed in the floor. Cargo can be moved into the huge compartment of the transport by power winch. Rapid tie-down is accomplished by dropping specialized cargo nets over the load, thus reducing ground-handling time.



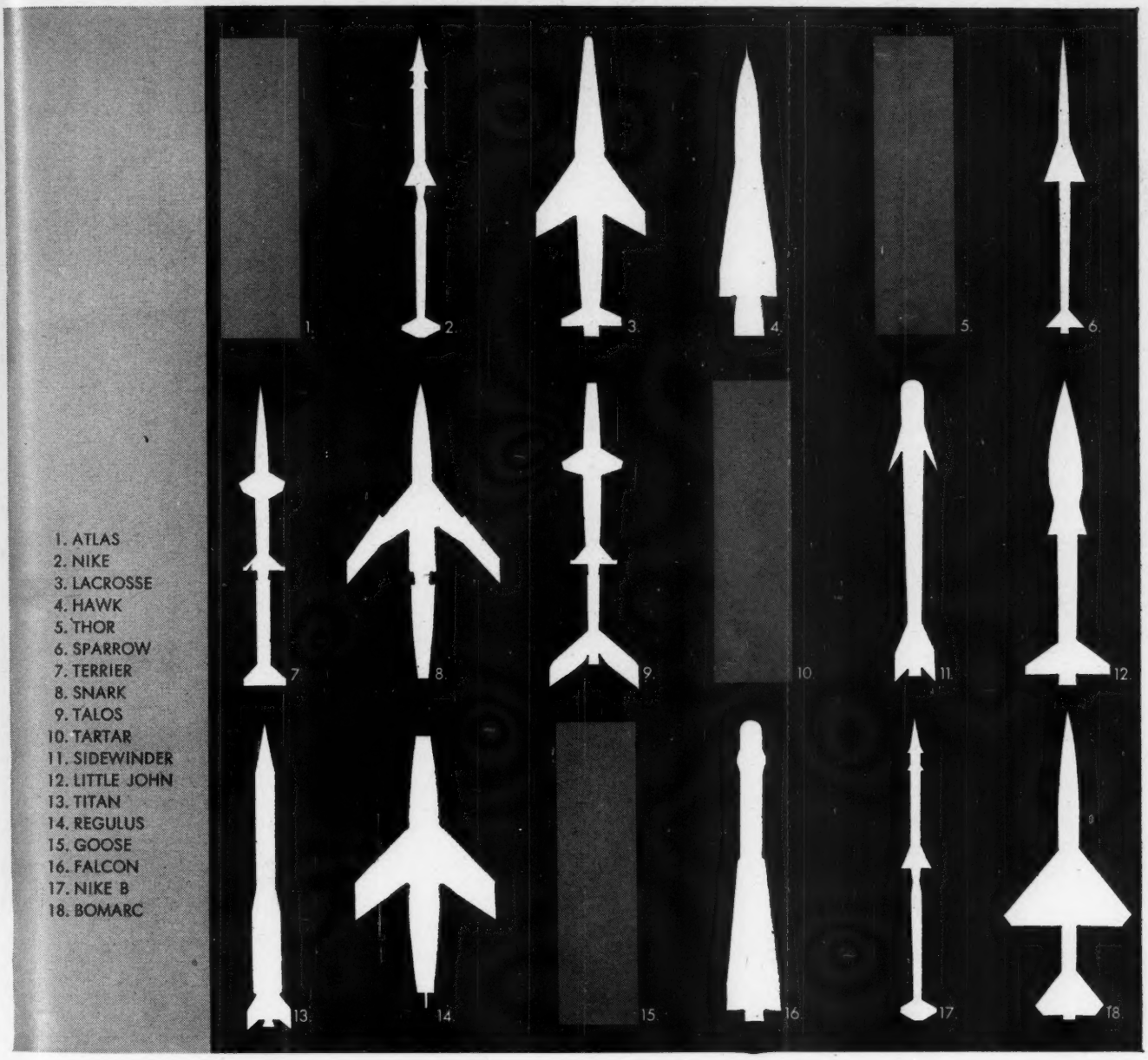
The Nike-Hercules, Army's new surface-to-air guided missile at White Sands.

Elgin National Watch Co. and **Walter Kidde Nuclear Laboratories, Inc.,** have announced joint development of a **miniature nuclear-powered battery** capable of delivering continuous electrical power for at least **five years.** The battery *(see cut),* about

(Continued on page 105)



Tiny atomic-powered battery can produce five years of usable electricity.



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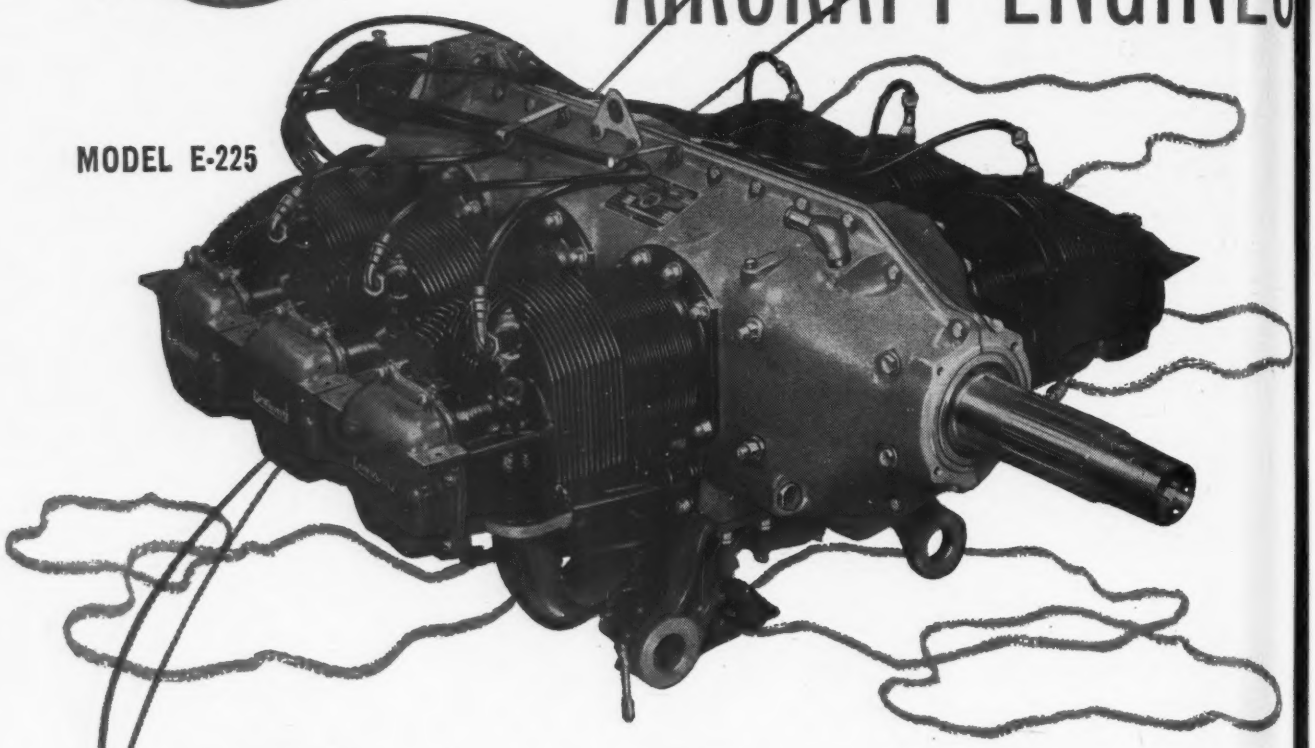

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A65-8F.....	65	2300	4	172	80
C90-12F.....	90	2625	4	186	80
O-300-A & B....	145	2700	6	311	80
E-225.....	225	2650	6	363	80
O-470-K & L....	230	2600	6	438	80
O-470-M.....	240	2600	6	450	91/96
O-470-G.....	240	2600	6	466	91/96
O-470-H.....	240	2600	6	510	91/96
FSO-526-A..... (Helicopter)	270	3000	6	568	91/96
GSO-526-A.....	320	3000	6	560	91/96

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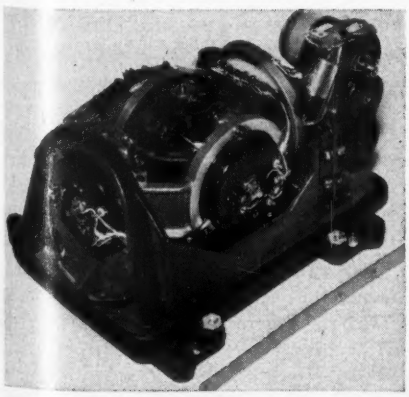
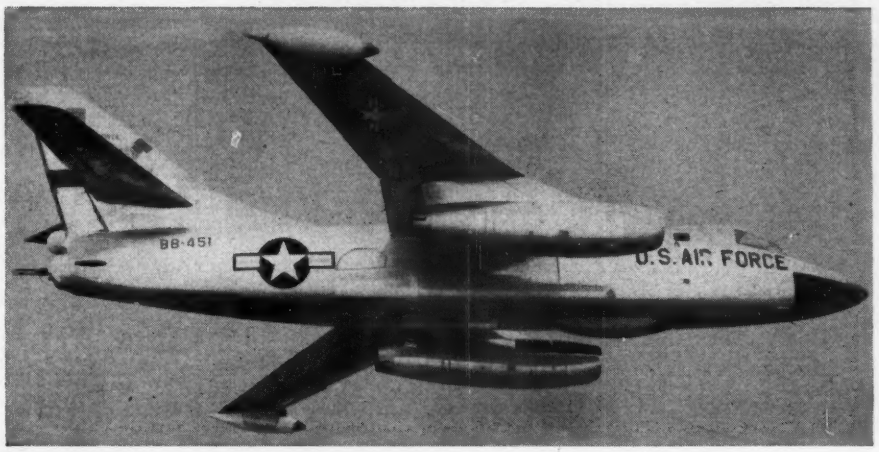
the size of a thumb tack, has a nominal power output of twenty microwatts and is the first such device to be **completely safe** for extensive personal use without special precautions. The battery utilizes the decay energy of a **beta-emitting radioisotope, promethium-147,** as its source of energy. Although not yet commercially available, the battery will eventually be used in such products as **hearing aids, miniature portable radios,** and **civilian-defense warning receivers** for the home. Its wide range of applications include high-altitude missile and rocket tests. In contrast to conventional batteries, the nuclear source operates satisfactorily at extremes of environmental conditions. At temperatures as low as 200 degrees below zero Fahrenheit, voltage and power output **actually increase.**

The latest model of USAF's newest jet light bomber is the **Douglas RB-66C,** an electronic reconnaissance aircraft *(see cut),* presently undergoing **employment and suitability testing** at the Air Proving Ground, Eglin AFB, Fla. The new "C" model is basically the same as previous models except for the addition of specialized equipment for electronic reconnaissance. It is equipped with **radomes on each wing tip** and under the fuselage. Two twenty-mm. cannon are mounted in a tail turret. The RB-66C carries a **crew of seven** (as opposed to the three-man crew in earlier models). The additional four men are observers.

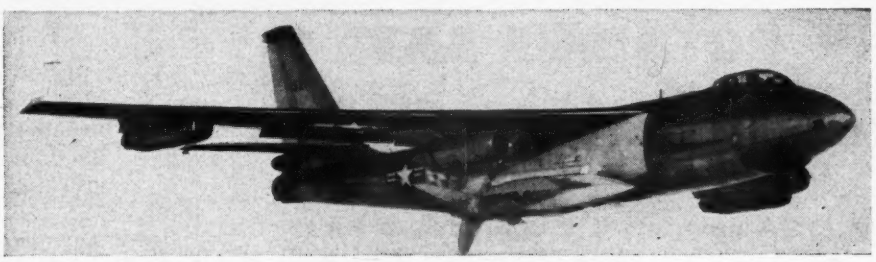
A new **cageable vertical gyro,** with recently patented features, has been announced by the **Minneapolis-Honeywell Regulator Co.** The gyro *(see cut),* will be used in stabilization and flight-control systems for aircraft, special weapon systems, radar stabilization, and telemetering applications requiring angular position references.



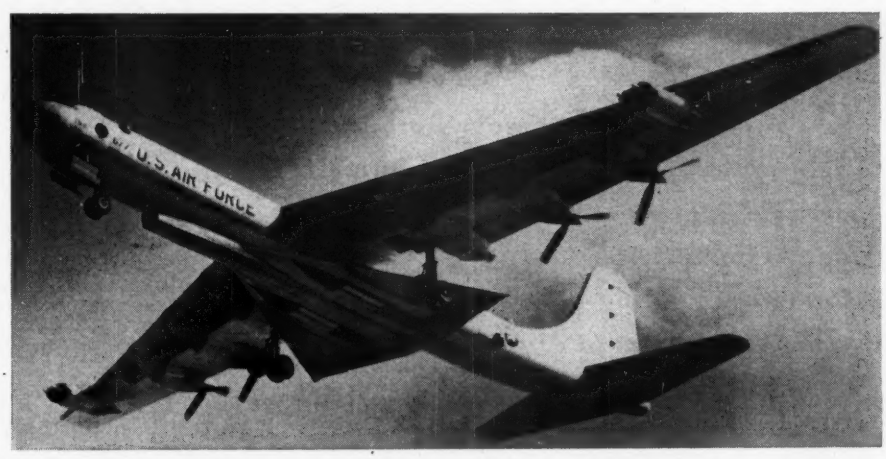
Minneapolis-Honeywell has increased the accuracy of reference gyros with its new GG53A cageable vertical gyro.



Latest model of the Douglas B-66 is the RB-66C electronic reconnaissance aircraft. Wing tips are equipped with radomes and tail turrent has 20-mm. cannon.



Bell's guided missile, Rascal, fits under the wing beside the fuselage of a Boeing B-47. Launched miles from the target, it rockets alone to the target.



Called the "world's fastest bomber," the Convair B-58 is carried under the belly of world's largest bomber, the Convair B-36, in an unusual air transport operation recently. The delta-winged B-58 was partially tucked into the bomb bay of the B-36, which airlifted its cargo, non-stop, from Fort Worth, Tex., to Wright-Patterson AFB, Ohio. Two inboard propellers were removed from the B-36 for the trip. AF is putting the B-58 through extensive tests.

Honeywell, after producing some **20,000 of the JG series** of gyros, designed this **GG53A** to fit in the same space as the JG gyros.

American Airlines has placed an order with **Erco Division, ACF Industries, Inc.,** for **electronic flight simulators** for its forthcoming fleet of **jet airliners.** The simulators will be designed and manufactured by Erco to the airline's specifications—one each for American's **Lockheed Electra prop-jet** and the **Boeing 707 turbojet**—and will be ready for delivery early in 1958. They will permit American's flight crews to accumulate considerable flight experience well in advance of the arrival of either jet type. With this order from the nation's largest carrier, **Erco** moves into the commercial flight simulator field **for the first time. Housed completely in trailers** for maximum mobility, the training units can be moved easily to any of the airline's major bases across the country. The simulators should simplify crew transition for jet flight.—END

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CHECKERTAIL CLAN REUNION: We are continuing our efforts to locate the addresses of former members of the 325th Fighter Group. Will all former members of the 317th, 318th, and 319th Fighter Squadrons of the 325th Fighter Group who are not receiving Clan bulletins about our 15th Annual Reunion please contact me. The Reunion is being held at Cleveland, Ohio, on August 2, 3, and 4, 1957. *A. J. Batulewick, 1440 East 53d St., Cleveland, Ohio.*

10TH AIR DEPOT GROUP REUNION: The annual reunion of the 10th Air Depot Group Association will be held at Detroit, Mich., August 9, 10, and 11, 1957, at the Hotel Fort Shelby. Those interested in attending please contact *Jack R. Morris, 19349 Washtenaw, Harper Woods, Mich.*

94TH INFANTRY DIVISION REUNION: The 8th Annual Reunion of the 94th Infantry Division Association, Inc., is being held at the Hotel New Yorker, New York, N. Y., July 18-21, 1957. For further information write *A. E. Rodriguez, Secretary, 614 Oakdale Ave., Chicago 14, Ill.*

HARTZEL D. HESS: As the widow of Capt. Hartzel D. Hess, I need help on a claim from men who served with him in the CBI theater. My husband passed away after the regrowth of a brain tumor. His service in CBI was from July 31, 1944 to late July or August 1945 as a C-47 pilot with the 1st Combat Cargo Group, 1st Combat Cargo Squadron. He suffered severe headaches while there and wore dark glasses on all flights—which may be one way some of the men may recall him. The men I need to hear from particularly are: Maj. Frank S. Aitken; Lts. John L. Purdum, Laurence M. Eichorn, Gordon T. Blair, Constantine J. Kinnas, and Leonard R. Whatley; Capt. Jack G. Miller; Sgts. Ward W. Heller and Jack D. River (or Riner); and Cpl. William T. Cosgrove. *Mrs. Helen R. Hess, M. R. Box 42, Chesterton, Ind.*

BOOK ON THE C-47: We are working on a book about the C-47 airplane and are interested in getting personal experience stories about the plane from units or people throughout the Air Force. We would like the stories in rough draft form which could be used to build factual or fictional anecdotes. Dates, names, places, times, etc., are needed. *Lt. Col. Carroll V. Glines and Maj. Wendell F. Moseley, Air Command and Staff College, Air University, Maxwell AFB. Ala.*

MATERIAL ON P-39: I am gathering material for a book on the Bell P-39 Airacobra and would like to hear from former pilots who flew the P-39 in combat in the Pacific in World War II. Would also appreciate word on unit histories, personal experiences, information on P-39 tactics, and similar material, including photos. Research material will be returned to owners, if requested. Address all information to *Martin Caidin, 97-37 63d Rd., Rego Park 24, N. Y.*

WORLD WAR I INSIGNIA: I would like to locate either a colored picture or a decal of the 638th Aero Squadron, 5th Pursuit Group, stationed in France in 1917-1919. *John J. Hardnedy, 2 Jackson St., Windsor Locks, Conn.*

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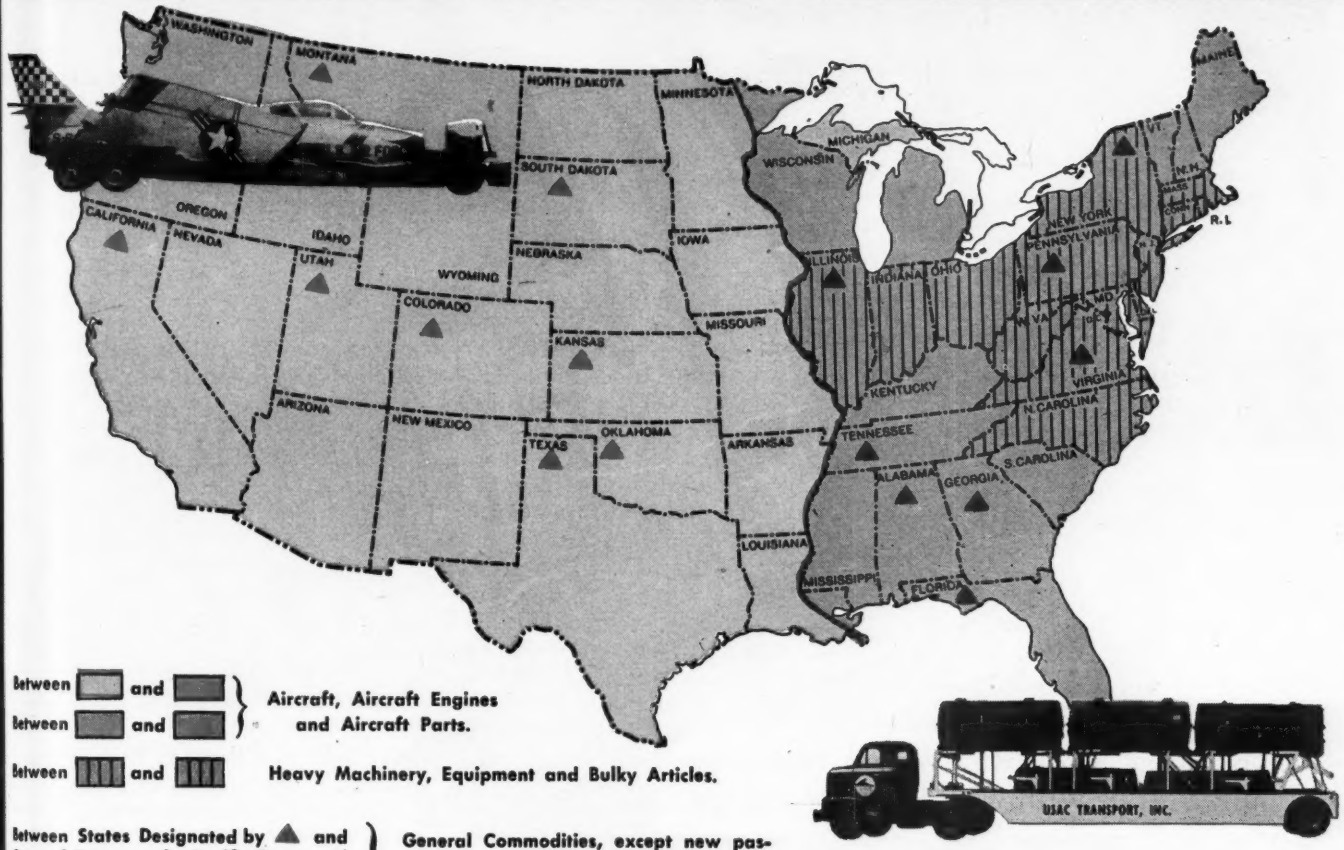

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SPECIFICATIONS:

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35 watts, 400 cycles, 115 volts, single phase
0.6 gal. per min. at 2000 psi hydraulic pressure

Regulation: ± 5% voltage and frequency

Duration:	27 seconds
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Size:	6.14 in. diam., 6.74 in. long

Ground power: compressed air

This AiResearch auxiliary power package operates the vital electrical and hydraulic systems in a missile.

Gases from a solid propellant spin the unit's turbine wheel at 50,000 rpm. The turbine's shaft drives the following: a 650 watt generator which supplies electrical power to run the missile's guidance system; a 35 watt generator which runs the missile's gyros; a hydraulic pump which in turn powers the servos that control the movable flight surfaces of the missile's airframe.

The hydraulic system features drilled passages which eliminate the need for potentially troublesome plumbing. It includes reservoir, filters, temperature compensator, relief valve, check valve, and squib valve within a single housing.

This auxiliary power system is an example of AiResearch capability in the missile field. Inquiries are invited regarding missile components and sub-systems relating to air data, heat transfer, electro-mechanical, auxiliary power, valves, controls and instruments.

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AFA NEWS

SQUADRON OF THE MONTH

Capital City Squadron, Sacramento, Calif., Cited for

its successful Manpower and Education Symposium outlining the advantages and problems of the Jet Age to large numbers of educators and civic leaders.

In California, on March 2, **Sacramento's Capital City Squadron** climaxed three months of extensive preparation by staging its **"Manpower Symposium"** at the Senator Hotel. More than 250 educators, state and local dignitaries, and AFA and USAF representatives attended.

John R. Alison, past AFA President and Board Chairman, who served as General Chairman, kicked off the program with a statement of the objectives of the Symposium. **Dr. Nicholas DeWitt,** of the Russian Research Center at Harvard University, discussed Russian manpower developments, and stressed the importance of American education's meeting the challenge. **Brig. Gen. Alfred F. Kalberer,** Commander of SAC's 14th Air Division, then spoke on the combat-readiness and training of USAF crews. **AFA Director Peter J. Schenk,** Project Manager of General Electric's Technical Military Planning Operation at Santa Barbara, Calif., next outlined industry's need for technical manpower (*for text of Mr. Schenk's remarks, see page 52*). The speakers answered questions from a panel including **Dr. Roy E. Simpson,** State Superintendent of Public Instruction; **Hon. Lloyd Lowrey,** California Assembly; **William E. Zisch,** Vice President and General Manager, Aerojet-General Corp.; and **Robert L. Champion,** Executive Director, International Science Foundation.

The Hon. David S. Smith, Assistant Secretary of the Air Force for Manpower, was the guest speaker at the luncheon. His topic was "Manpower Needs."

The Symposium's afternoon session featured a discussion on the Sacramento area's problems in industry, education, and defense. The speakers were **Dan Kimball,** President of Aerojet-General Corp.; **Brig. Gen. Kenneth H. Gibson,** Commander, 8th Air Division, Air Defense Command; and **Dr. Alva Davis,** Dean Emeritus at the University of California at Berkeley. Members of the questioning panel were: **Hon. Stephen P. Teale,** California Senate; **William Johnson,** President, Sacramento City-County Chamber of Commerce; **Lee O. Stockford,** Director, Personnel Research, Lockheed Aircraft Corp.; and **Dwight R. Zook,** Director, Personnel Services, North American Aviation, Inc.

At the evening banquet, **Curtis E. Christensen,** California Wing Commander, presented citations to outstanding high school students from the area. **Dr. John F. Victory,** Executive Secretary of the National Advisory Committee for Aeronautics, addressed the audience on the subject **"Brainpower in the Jet Age."**

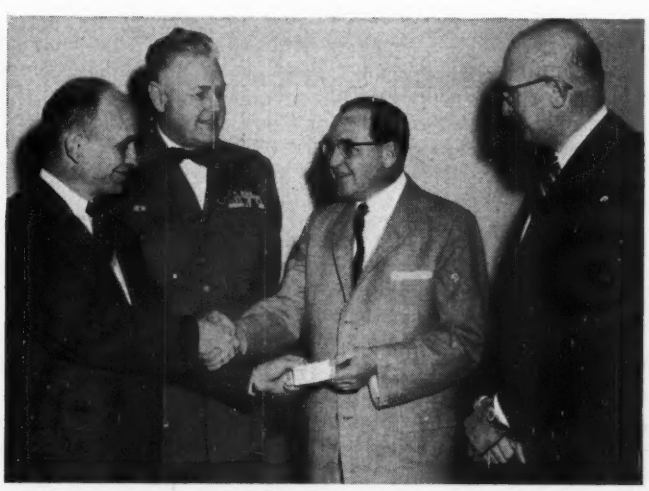
Dr. Nicholas DeWitt, of Harvard's Russian Research Center, addresses Manpower Symposium in Sacramento.

Through this program, the Capital City Squadron stressed our rapidly shrinking lead over Soviet Russia in the technological field and emphasized the related problems faced by educators in Northern California.

For this fine program, **Harvey McKay,** Capital City Squadron Commander, headed a list of committee

(Continued on following page)

Donald W. Steele (left), Commander of the Capital Squadron, and Walter L. Savage (right), District of Columbia Wing Commander, welcome Stan Reaver to Washington, D. C., National Airport. Reaver flew the replica of the "Spirit of St. Louis" to Washington for the opening of the new Warner Brothers' film story of Lindbergh's transatlantic flight.



At Syracuse, N. Y., Squadron's Air Transport Night program, Syracuse Mayor Donald Meade accepts honorary AFA membership from Northeast Regional Vice President Leonard Work. Looking on are Col. Leslie L. Heartz, from ADC's 32d Air Division, and, at right, Dr. George L. Haller, General Manager of General Electric's Defense Electronics Division.

At Santa Monica, Calif., installation, from left: LeRoy Prinz, Gil Nettleton, Maj. Gen. Archie Old, Jr., John Gilmore, Gene Raymond, and John Alison.

Frank Lovejoy, right, accepts plaque from San Fernando's Bob Feldtkeller.

workers that included **Clive Davis, Maj. Gen. A. W. Vanaman, USAF (Ret.), Eli Obradovich, Carson Sheetz, Reginald Blake, Jack Lawrence, Charles DeBedts, Ryan Polstra, William Gilson, Jim Laulis, Jay Fenner,** and **George Kopcho.**

Four new Squadrons join the ranks of AFA this month. They are **St. Paul, Minn.; Idaho Panhandle (Coeur d'Alene); Canton, Ohio; and Cambridge, Mass.**

Robert P. Knight, Minneapolis Squadron Commander, was instrumental in the formation of the new Minnesota Squadron. **Leo Goodrich** was elected Squadron Commander at a meeting at which **William G. Kohlan,** Minnesota Wing Commander, was a guest. Other officers are **Alfred C. Schwab,** Vice Commander; and **William Hite,** Secretary-Treasurer. Councilmen are **Edmund Antonini, Ray Miller, Robert Abercrombie,** and **Roger Foussard.**

The Idaho Squadron has been in the process of formation for several months, in a drive led by **Lewis Good,** a former member of the Robert S. Hart Squadron, New Orleans, who now lives in Coeur d'Alene. **Ralph E. Funke,** 508 2nd Street, was elected Commander, **James M. Trail,** an AFA Director who lives in Boise, was also instrumental in the unit's formation.

Meanwhile, **James D. Wohlford,** Ohio Wing Commander, led the formation of the Canton Squadron, and will present the Charter at a future date. The Commander is **Herbert Bryant,** 912 7th Street, N. E. Other officers are **Loren Dietz,** Vice Commander; **John Kline,** Secretary; and **Joseph Doody,** Treasurer. Councilmen are **John Gipp, Francis Kent, Robert Oberlin,** and **Benford Eubank.**

Paul F. Bartel, 689 Massachusetts Ave., is Commander of the Cambridge unit. **John O'Brien** is Secretary. The Charter was presented by **Phillipe Coury,** Wing Commander, who headed the organizational committee.

Another new Squadron, in **Green Bay, Wis.,** will be chartered about the time this is printed. **Herbert McCormack,** Wing Commander, will present the Charter to a group headed by **Mike Guerin,** who was in charge of the organizing program there.

A capacity crowd of 270 people jammed into the Palm Room of the Miramar Hotel in **Santa Monica, Calif.,** on March 9, to attend the **eleventh annual Installation Dinner** of the Santa Monica Squadron—California's first Squadron and the unit which won the "Squadron of the Year" trophy in 1953.

Maj. Gen. Archie J. Old, Jr., Commander of SAC's Fifteenth Air Force, was the principal speaker. He commanded the flight of the Boeing B-52s which circled the world non-stop this winter. General Old praised AFA for its work in promoting aviation, but called on the Association to double its efforts to **obtain greater benefits for the airman,** in order to help the AF retain the skilled men it needs.

LeRoy Prinz, of Warner Brothers Studio, who is a Charter AFA member, provided a change of pace as he recalled the highlights of his own aviation career when he flew with **Capt. Eddie Rickenbacker** in the famed **"Hat in the Ring" Squadron** during World War I. **John R. Alison,** past AFA President and Board Chairman, served as Toastmaster and installing officer for the program.

New officers include **Gil Nettleton,** Commander; **Chester Seftenberg,** Vice Commander; **Bill McQuinn,** Secretary; and **Tom Probasco,** Treasurer. Councilmen are **Mr. Alison, Tom McKnight, Russell Moss, Joseph Myers,** and outgoing **Commander John Gilmore** (*see cut*).

On the same evening the **Santa Monica Auxiliary** installed its new officers. They are **Pauline Stonehill,** President; **Peggy Seftenberg,** Vice President; **Alice DeBolt,** Secretary; and **Wilma Probasco,** Treasurer. The Auxiliary Council consists of **Rhoda Brandes, Jean McElliott, Jane Myers,** and **Pauline Vetensky.**

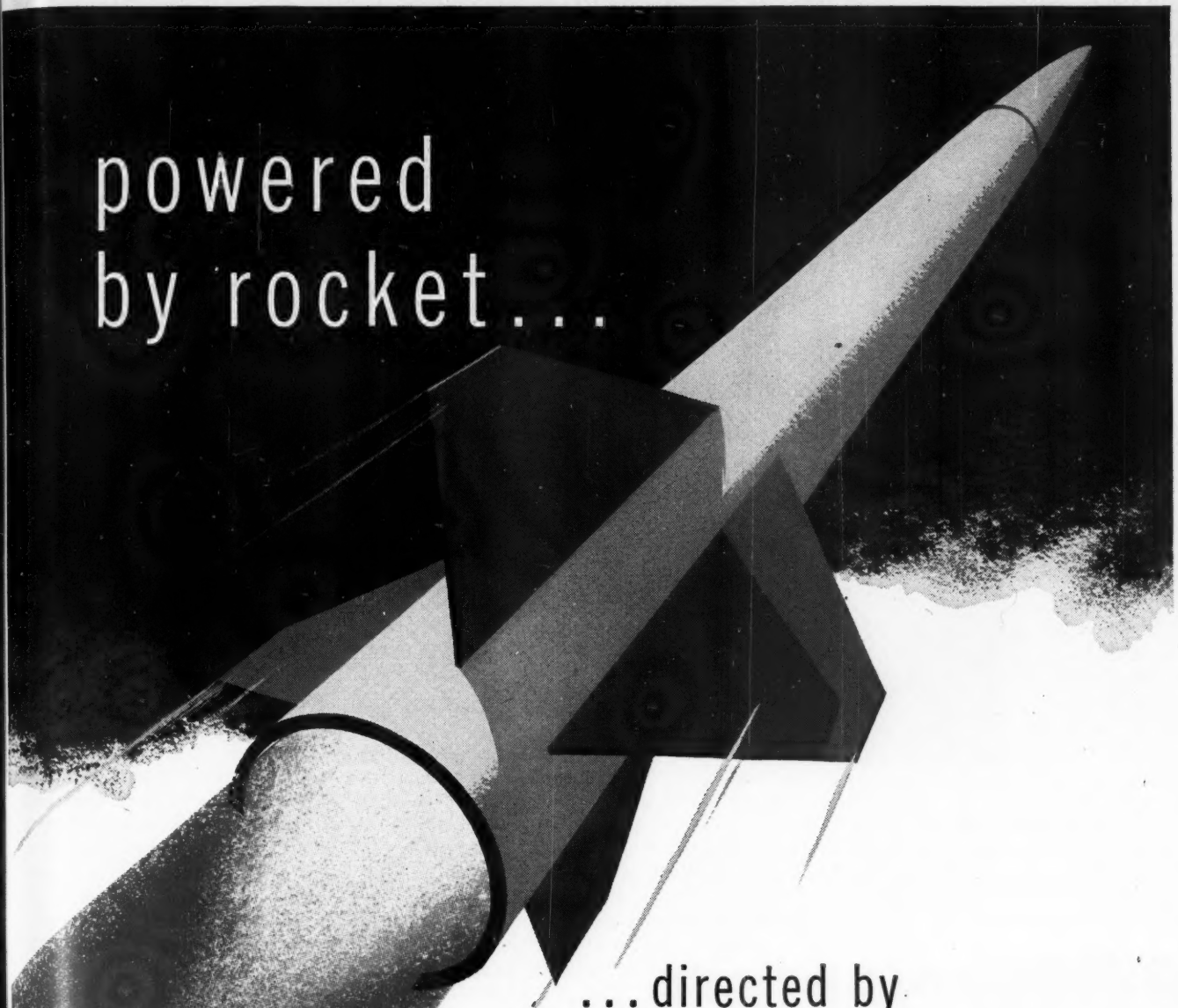
With a program called **"Let Industry Help Fighters Fight,"** the **San Fernando Valley, Calif., Squadron** played host on February 23 to more than 150 Valley civic leaders and AFA, USAF, and industry representatives. The object of the program was to **better acquaint the community with the aims** of the Air Force Association, some of the **problems the Air Force faces,** and what **advantages the aviation industry offers** to a community.

Jay Jester, a past Squadron Commander, was chairman of the program. The new Commander, **Bill Scroggins,** was formally introduced to the gathering.

Frank Lovejoy (*see cut*) was presented with an award in recognition of his many contributions to airpower through motion pictures, **Bob Feldtkeller,** outgoing Squadron Commander, made the presentation.

T. F. Walkowicz, of New York City, an AFA Director and member of the Airpower Policy Committee, was **guest speaker** at the March 21 meeting of the **Hagerstown, Md., AFA Squadron.** His subject was **"The Econ-**

(Continued on page 113)



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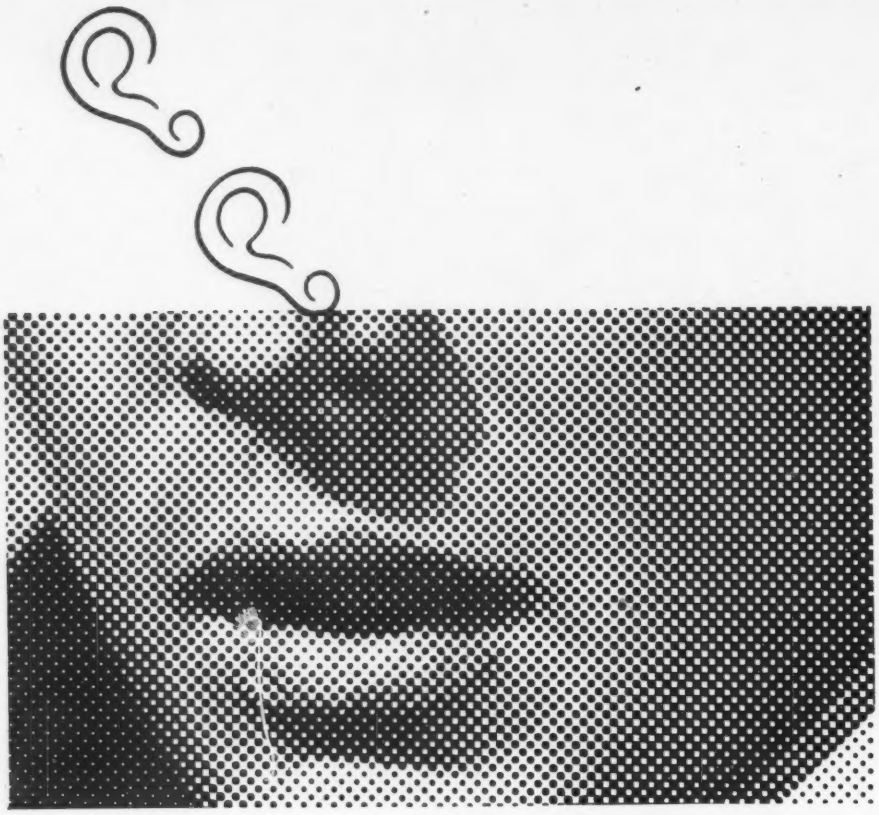

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Photo by Don Nelson

Jack Jenefsky, right, past Commander of the Wright Memorial Squadron, Dayton, Ohio, presents Wright Aviation Award for 1956 to Richard H. Shearin, Aviation Editor of the Dayton *Daily News*. The Squadron makes the award annually for efforts that contribute to an enlightened public conception of airpower.

omics of Airpower." **Roland Hebb,** Hagerstown Squadron Commander, introduced Mr. Walkowicz. **Paul Fonda,** Maryland Wing Commander; **Donald W. Steele,** Commander of the Capital Squadron in the District of Columbia; and **Gus Duda,** Organization Director, who attended as a representative of National Headquarters, were at the meeting, which was held at the Tortuga Restaurant.

California's annual Wing Convention, coming up the tenth through the twelfth of this month in San Diego, promises to be one of the most outstanding of the 1957 programs. **Convair's Ned Root** advises us that the highlight of the weekend will be the celebration on May 11 of the **Golden Anniversary of the Air Force.**

The program will begin with a reception and **reunion of "Spirit of St. Louis" builders** and other Lindbergh associates, and a Lindbergh Tribute Dinner on the evening of May 10. This month marks the **thirtieth anniversary** of Lindbergh's famous transatlantic flight.

On the morning of May 11 an Air Force static display, plus fly-overs of modern aircraft will be held at **Lindbergh Field.** A replica of the "Spirit of St. Louis" will also be featured. An Anniversary Celebration luncheon, with a **featured Air Force speaker,** will be held that noon.

Convention features will be written up in a future issue, but we suggest that every AFA member in California plan to be on hand for this convention, which is annually one of the best in the Association. **Curtis Christensen,** 17907 Tarzana Street, Encino, will furnish additional details upon request.

CROSS COUNTRY. . . . The Illinois Wing, through the cooperation of **George Edgecumbe,** Manager of the Elgin Airport, had a display at the recent Chicago Sportsman's Show. It consisted of a three-paneled unit exhibiting the national and local objectives of AFA, and was on display to thousands of visitors. . . . Speaking of advance notice on programs of great interest, **AFA's 1958 National Convention and Airpower Panorama** will be held in **Dallas, Tex., September 22-28.** . . . **Maurice Marrs,** 4328 N. W. 23d St., Oklahoma City, has been elected Commander of the **Oklahoma Wing,** succeeding **Hardin W. Masters,** who is now a member of the Board of Directors. . . . **Detroit's Vandenberg Squadron** has selected **May 13** as the date for the **second annual Awards Banquet** honoring AF-ROTC Cadets from four area colleges: Wayne, Michigan, Michigan State, and Detroit. . . . The annual reunion of the **"Doolittle Raiders,"** the crews of the B-25s that bombed Tokyo in 1942, was held at Eglin AFB, Fla., **on April 18,** the fifteenth anniversary of the historic flight. . . . **Dates in May to remember:** May 10-12 in San Diego—**California Wing Convention;** May 18—**Armed Forces Day;** May 19 on Long Island—**H. H. Arnold Squadron's "Long Island Aviation Pioneer Day";** May 25-27 in Lake Charles, La.—**Louisiana Wing Convention;** May 25-26 in Akron—**Ohio Wing Convention;** May 24-26 in Pittsburgh—**Pennsylvania Wing Convention;** May 25-26 in Battle Creek—**Michigan Wing Convention.**

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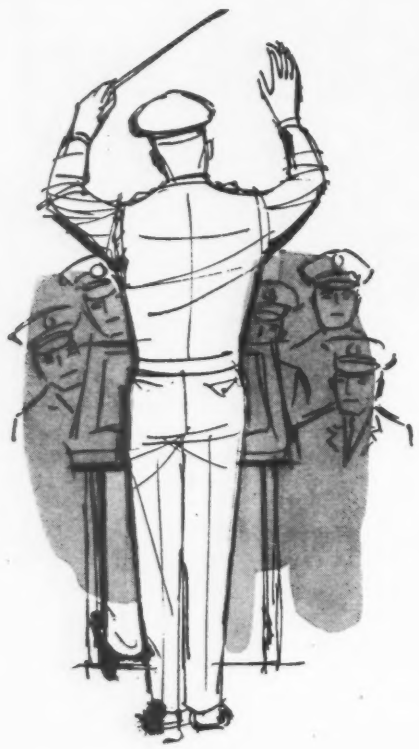

By M/Sgt. Frank J. Clifford

THERE was no whitewashing the fact—the Wing was in terrible shape and getting worse each day. Six months before, it had been one of the top combat-ready Wings in the Command, consistently adding luster to a proud wartime record. It had been the kind of an outfit a man would pull strings to get into.

Now it was staggering around, trying half-heartedly to regain its balance. Spirit was lacking. Apathy had replaced cocksure confidence. If any one thing characterized the Wing, it was the universal eagerness of its members to top each other in describing how "fouled-up" things were.

The long slide into the cellar began with a cross-country change of station that shifted the Wing from a comfortable, well-established base to a remote station that had been on stand-by status for two years.

Even before the move began, the Wing suffered a serious blow from a decision that men without at least a year's retainability were to be left behind. Regardless of how valuable such a man might be to the Wing, the Commander had to strike him from the roster—a quirk in the regulations pertaining to permanent change of station prohibits more than one PCS move in a given fiscal year.

Partly as a result of this ruling, the Wing embarked on what was to be one of its severest tests almost fifty percent undermanned. Personnel would fill the gaps with replacements from tech schools and basic training centers, it was hoped. In the meantime, each crew chief adopted two or three orphaned aircraft.

The new base was a severe jolt to men accustomed to the ease and convenience of their last station. Home of a money-starved, undermanned, and undisciplined housekeeping unit for the past two years, the base was a wilderness, its buildings adrift in a sea of knee-high weeds. Barracks and other buildings, long unoccupied, bore mute testimony to neglect and lack of maintenance.

But like the crack Wing it was, the men buckled down to "getting operational" as quickly as possible. Weeds were hacked down, barracks cleaned up, and a base-side painting contract let. Crackling activity seemed to confirm the advance party's prediction that, "Everything will be okay when the Wing gets here." The pipe line pumped new people into the Wing—but never enough and not always in the needed AFSCs.

Then the endless, nagging procession of small annoyances set in, punctuated from time to time by occur-

(Continued on page 117)

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rences that would be serious even on fully equipped, stabilized bases.

A demoralizing shortage of even the most basic kinds of equipment—typewriters, hand tools, mess equipment, spare parts of all kinds—quickly became apparent. The supply system moved in slow motion and sometimes not at all. Working NCOs resorted to the "buddy" system to supply their sections, but this soon broke down because there were no supplies.

A cynical attitude toward the job and the Wing developed. A sergeant ramrodding a crew detailed to set up equipment for an on-base school was told, "That's your problem," when he asked where he might get tools to do the job. He did the job, and finished on time, too, but as far as he was concerned, the Wing was the most fouled-up outfit he had ever been in and he took every opportunity to tell his story.

At year's end, six months after its change of station, the Wing was in serious condition. It would take a miracle if the Commander were to pull it out of the cellar. As far as the troops were concerned, it could stay there. They were convinced that the Old Man was either floating on a pink cloud, totally unaware, or that he just didn't give a damn—especially about them.

Then the miracle happened. The Commander took off his rose-colored glasses and took a long, hard look at his Wing in stark black and white.

What prompted him to do so no one knew. Maybe it was a miracle, after all. Maybe he suddenly remembered all he had learned, and forgotten, about basic principles of leadership, management, and public relations. Perhaps at the end of one of his fourteen-hour days it suddenly dawned on him that he was a one-man band.

Whatever it was, it changed his way of living and thereby revitalized a Wing that was close to becoming a classic example of how to go to hell in a hurry.

The first noticeable change came when the Commander instructed his Executive to lay on a meeting for him with all of his master sergeants. No one was more surprised than the Exec, who had often recommended just that, only to be turned down. "Too busy," had been the explanation.

The meeting was a tremendous success. The sergeants had entered the hall in a defiant mood, prepared to endure a chewing. It would be the same old pious junk, they were sure; the wiseacres were actually glad to be there—it would provide them with cynical ammunition for future use. For many, especially those who had joined the Wing in the past six months, this was the first time they had seen their Commander face to face.

But this meeting was different. The man on the stage wasn't the grim, unapproachable that reputation insisted he was. They saw a man who appeared to be approaching his forties, of average height, trim, and immaculately uniformed.

A relaxed atmosphere swept through the theater as the Commander began to speak. A good talker, he traced the history of the Wing for the past six months. With utter candor he told the men that the Wing was the lowest on the Command totem pole. And then he told them how it got there.

It was an absorbing story, peopled with unnamed flesh-and-blood characters and recognizable, real-life incidents. The audience identified themselves with the Wing but now they viewed it from the Commander's viewpoint. As he spoke, the Wing became a live thing and not merely a fouled-up number in the Line of Battle.

He outlined plans for the coming year, described what had been done

(Continued on following page)

The way to straighten out a fouled-up outfit, the Old Man discovered, was a liberal application of human relations.

to remedy faults. The future held definite goals, and he pointed these out and explained how they would be reached. This was information from the "horse's mouth" and they strained to catch every syllable. Besides, it was interesting and the audience gained the impression that they were being trusted with inside stuff for the first time.

There was no hell-raising, no exhortations to hit the sawdust trail, no talk of stripes being lifted. It was the kind of presentation an honest Commander would make to his peers or superiors. Scheduled to last an hour, it ran ten minutes beyond two hours. When he concluded with, "Thank you, gentlemen," the instant of silence which followed was blasted by a roar of applause.

The Commander's *honchos* were with him to a man.

The weekly staff meeting which followed was shorter than usual and uncommonly relaxed. Winding it up, the Commander said, "This is the last of our weekly meetings—from now on we will meet once a month, or at my call." He told the staff they were on their own, free to make decisions without consulting him for detailed instruction. Mistakes would be the by-product of action and a necessary tuition for learning, he reminded them.

(He didn't say so, but he was announcing his abdication from a position of his own creation—the absolute control of every detail in the operation of the Wing.)

"This arrangement will give each of you a freer hand to work for the Wing and will give me an opportunity to view the 'Big Picture' without being all over the scenery. I'm not relaxing. I'm merely redirecting my efforts. I'll work from your reports, and I'll depend on them to give me an accurate reading on what the Wing is doing—or not doing.

"Reports with a pie-in-the-sky flavor, or reports prepared to 'make things look good for the Old Man' will hang you. I have no mysterious powers that enable me to tell at a glance what is fact and what is fiction. It is simply that all agencies of the Wing are intertwined—a report that is not strictly on the level will expose itself, and the writer, sooner or later. But you all already know this."

Within a week, the Old Man relinquished his duties as first sergeant and unit commander of all the organizations in the Wing. The "one-man band" was now inviting players to participate who had been standing nervously in the wings, waiting for the cue to perform roles they knew better than the maestro. Wing letters were rewritten, returning wherever possible, disciplinary and other matters properly within the bailiwick of a first sergeant, squadron, or group commander, which had gradually accrued to the Commander.

Apparently the Old Man liked the big picture. At any rate, he took increased opportunity to see more of it—on foot, in visits to maintenance shops, docks, flight line, warehouses, kitchens, orderly rooms—his whole domain. At first the visits were painfully stiff and formal, since the troops did not know what to expect. (The rank and file, most of them, were seeing him in the flesh for the first time.)

When they learned that his interest was sincere, that he was not delib-

(Continued on page 121)

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erately looking for something to chew about, the barriers came down. Soon his visits were greeted with smiles. It became a matter of pride for a noncom to remark to his friends, with studied nonchalance, "I was talking to the Old Man today and he told me. . . ."

The Commander was becoming the Old Man in fact as well as in name.

That he might drop in on any section at any time became a well-known probability, and this served to keep operations running tautly. And the sections shaped up not out of fear, but because they had something to be proud of, and they wanted the Old Man to see it.

NCOICs were agreeably surprised when he addressed them by name. Their surprise was even greater when he made knowledgeable comment on current operational problems. As a flying man, it was natural for him to be at home in the technical world of aircraft and aircraft maintenance, and he subtly let this fact be known. In other fields—supply, personnel, finance—his questions and remarks had the solid ring of a man who knows what he is talking about.

(Actually, there was no mystery about his *apparent* proficiency in a wide variety of fields. His Inspector had sometime before supplied him with a folio of Inspector's Check Lists covering just about every activity in the AF. These lists, consulted prior to visiting a section, and combined with high intelligence and a better-than-average store of service savvy, provided questions that were penetrating and pertinent.

(The name business was even easier—many he read directly from the name tag sewed on fatigues. The others he locked onto the first time around when the NCO was introduced or when the man reported. The important thing was that he used the name gimmick skillfully.)

A new spirit filtered through the Wing. The Old Man *was* concerned about them, and the troops were quick to reciprocate. Pride gradually replaced apathy. The "Commander's Column" in the base newspaper was now being read without cynical comment because the troops knew he was writing it, and not his ISO. Besides, they knew the guy, and they liked him.

By the time the first quarter of the new year had been ripped from the calendar, the Wing was out of the cellar and striding down the road toward full recovery. The corner had been turned.

The victory was largely one of human relations—and common sense. Officers and NCOs were shifted around and ineffectives eliminated. A wobbly supply structure was almost entirely rebuilt. Squadron commanders and first sergeants, the reins once more in their hands, wasted no time in showing that a first-class outfit lives first-class, in clean barracks and neat squadron areas.

But it was largely human relations. For all of its might, its machinery and its organizational charts, a Wing was, first and last, *people*, the Old Man discovered. (He had known it all along, of course, but he had been too busy to pay much attention.)

He relearned a lesson assimilated long before—a leader can lead only if he has *willing* followers. Unless the followers know he is interested in their welfare they will never demonstrate that plus quality of willingness. The ivory tower might be fine for planning all kinds of good and progressive things, but too few people get an opportunity to learn what goes on in the tower.

They have to be told, in plain words—and then kept informed. Perhaps it was with this in mind that the Old Man published a one-page weekly mimeographed memo called "Commander's Note Book" in which he gave a short, running account of the status of a wide variety of things—better dry-cleaning service, planned construction on the base, expected changes, explaining why a current rumor couldn't be true—of interest to the Wing (he got an assist from his ISO on this one).

Is the foregoing a factual account of the experience of a real Wing? Perhaps it is—perhaps it is merely a composite of things which could make a good Wing bad, and the steps which might be taken to put it back among the high rollers again.—END

ABOUT THE AUTHOR

Frank Clifford's name has been appearing in this magazine on and off for a number of years, most recently with his article in the February '57 issue, "So You Finally Made Master Sergeant." The outfit whose sorry plight Sergeant Clifford describes in the accompanying story does not, in fact, exist. It could, however. If it did, his "steps-that-could-be-taken" might come in handy. Sergeant Clifford is now stationed in France, in Information Services at the Headquarters Squadron of the 50th Fighter-Bomber Wing.

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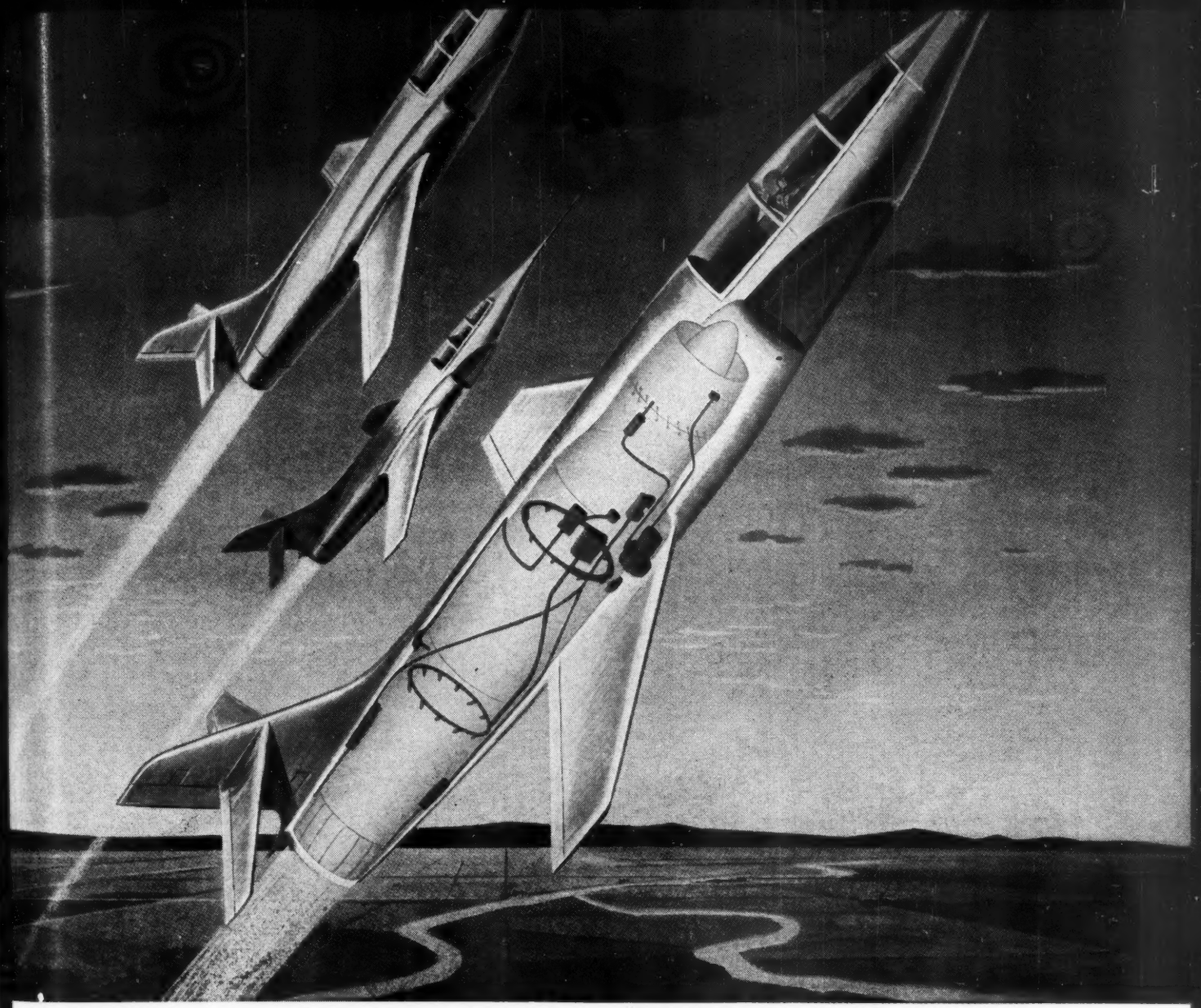

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